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MASSACHUSETTS AGRICULTURAL COLLEGE

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1901-1902

S. Francis Howard,
Amherst, Mass.

CATALOGUE

OF THE

MASSACHUSETTS

AGRICULTURAL COLLEGE

1901-1902

AMHERST
PUBLISHED BY THE COLLEGE
1901

Calendar for 1901-1902

1901			
September	19	Thursday	First semester began at 8 A. M.
November	28	Thursday	Thanksgiving Day
December	19	Thursday	Holiday recess begins
1902			
January	2	Thursday	8 A. M. Holiday recess ends
February	5	Wednesday	First semester ends
February	6	Thursday	8 A. M. Second semester begins
March	29	Saturday	Spring recess begins
April	2	Wednesday	8 A. M. Spring recess ends
May	30	Friday	Memorial Day
June	14	Saturday	Grinnell prize examination of senior class in Agriculture
June	15	Sunday	Baccalaureate sermon
June	16	Monday	Flint prize oratorical contest Burnham prize speaking
June	17	Tuesday	Meeting of the alumni Class day exercises, battalion drill, reception by the president and the trustees
June	18	Wednesday	Commencement exercises
June	19, 20	Thursday and Friday	8-30 A.M. Examinations for admission at Botanic Museum, Amherst; Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; Sedgwick Institute, Great Barrington; Horticultural Hall, Worcester

Vacation of Thirteen Weeks

September	16, 17	Tuesday and Wednesday	8-30 A. M. Examinations for admission Botanic Museum
September	18	Thursday	8 A. M. First semester begins

Origin, Object, and Location

The Massachusetts Agricultural College was among the first of the institutions to be established under the provisions of the National Land-Grant Act of 1862. This Act donated "public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." The framer of this bill was the late Senator Justin Smith Morrill of Vermont. At the present time over sixty institutions of higher learning in this country directly owe their origin or their prosperity to the benefits of this great educational measure.

The college was incorporated in 1864 by an Act of the State Legislature; and on the second of October, 1867, was formally opened to an entering class of thirty-three.

In January, 1875, an arrangement was made with the authorities of Boston University, whereby the college, without losing its independence, should thereafter become the "School of Agriculture" of the university. By means of this arrangement, students of the Massachusetts Agricultural College, besides obtaining the regular diploma of the college, which is accepted by American universities and by the University of Göttingen, in Germany, may, upon payment of a fee, receive the diploma in science awarded to graduates of the Boston institution. In 1882 the State Experiment Station was located on the college grounds. The station has since become connected with the college.

The college offers a free education to any American student who may be of good character and who may fulfill the requirements for admission. Women are admitted to the courses of the institution with a few exceptions on the same conditions as men. It also offers its course of study to foreign students upon payment by them of a tuition fee. It gives a four years' course leading to the degree of Bachelor of Science, and a graduate course leading to the degrees of Master of Science and of Doctor of Philosophy. It also offers a winter course of eleven weeks.

The college is situated in the beautiful town of Amherst. The grounds are especially attractive, and comprise over 400 acres of land, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent.

Amherst is ninety-seven miles west of Boston. It is on the line of the Southern Division (Central Massachusetts Railroad) of the Boston and Maine Railroad, as well as on that of the Central Vermont Railway. It is easily accessible.

The Corporation

	Term expires
ELIJAH W. WOOD, West Newton	1902
CHARLES A. GLEASON, New Braintree	1902
JAMES DRAPER, Worcester	1903
SAMUEL C. DAMON, Lancaster	1903
HENRY S. HYDE, Springfield	1904
MERRITT I. WHEELER, Great Barrington	1904
WILLIAM R. SESSIONS, Springfield	1905
CHARLES L. FLINT, Brookline	1905
WILLIAM H. BOWKER, Boston	1906
GEORGE H. ELLIS, Boston	1906
J. HOWE DEMOND, Northampton	1907
ELMER D. HOWE, Marlborough	1907
NATHANIEL I. BOWDITCH, Framingham	1908
WILLIAM WHEELER, Concord	1908

MEMBERS EX OFFICIO

His Excellency W. MURRAY CRANE
Governor of the Commonwealth

HENRY H. GOODELL
President of the College

FRANK A. HILL
Secretary of the Board of Education

JAMES W. STOCKWELL
Secretary of the Board of Agriculture

OFFICERS OF THE CORPORATION

His Excellency Governor W. MURRAY CRANE	*President*	Boston
HENRY S. HYDE	*Vice-President*	Springfield
JAMES W. STOCKWELL	*Secretary*	Boston
GEORGE F. MILLS	*Treasurer*	Amherst
CHARLES A. GLEASON	*Auditor*	New Braintree

Board of Overseers

STATE BOARD OF AGRICULTURE

EXAMINING COMMITTEE OF OVERSEERS

John Bursley (Chairman)	West Barnstable
C. K. Brewster	Worthington
Wesley B. Barton	Dalton
Alvan Barrus	Goshen
Warren C. Jewett	Worcester

Faculty

HENRY H. GOODELL, LL.D.
President of the College

LEVI STOCKBRIDGE
Professor of Agriculture, Honorary

CHARLES A. GOESSMANN, PH.D., LL.D.
Professor of Chemistry

SAMUEL T. MAYNARD, B.SC.
Professor of Horticulture

CHARLES WELLINGTON, A.M., PH.D.
Associate Professor of Chemistry

CHARLES H. FERNALD, A.M., PH.D.
Professor of Zoölogy

REV. CHARLES S. WALKER, A.M., PH.D.
Professor of Political Science, Chaplain, and Secretary of the Faculty

WILLIAM P. BROOKS, PH.D.
Professor of Agriculture

GEORGE F. MILLS, A.M.
Professor of English and Latin

JAMES B. PAIGE, D.V.S.
Professor of Veterinary Science

GEORGE E. STONE, PH.D.
Professor of Botany

JOHN E. OSTRANDER, A.M., C.E.
Professor of Mathematics and Civil Engineering

HENRY T. FERNALD, PH.D.
Professor of Entomology

JOHN ANDERSON, CAPTAIN, U.S.A.
Professor of Military Science and Tactics

HERMAN BABSON, A.M.
Assistant Professor of English

FRED S. COOLEY, B.SC.
Assistant Professor of Agriculture

RICHARD S. LULL, M.SC.
Assistant Professor of Zoölogy, and Curator of the Zoölogical Museum

RALPH E. SMITH, B.SC.
Assistant Professor of Botany, and Instructor in German

PHILIP B. HASBROUCK, B.SC.
Assistant Professor of Mathematics and Physics

SAMUEL F. HOWARD, M.SC.
Assistant Professor of Chemistry and Geology

GEORGE F. BABB, A.B.
Instructor in French

DANIEL LUNT CLEAVES, B.SC.
Instructor in Chemistry

ROBERT W. LYMAN, LL.B.
Lecturer on Farm Law

E. FRANCES HALL
Librarian

RICHARD S. LULL, M.SC.
Registrar

ELISHA A. JONES, B.SC.
Superintendent of Farm

NEWTON WALLACE
Electrician

Committees of the Faculty

Discipline and Friendly Relations: The PRESIDENT, Professors MAYNARD, H. T. FERNALD, BROOKS

Instruction: Professors MILLS, OSTRANDER, WELLINGTON, the REGISTRAR

Athletics: Professors PAIGE, LULL, SMITH

Catalogue: Professors WALKER, OSTRANDER, BABSON, the REGISTRAR

Entrance Examinations: Professors MILLS, BABSON, LULL, HASBROUCK

Rules: Professors WALKER, LULL, BABSON

Graduate Courses: Professors C. H. FERNALD, WELLINGTON, STONE, H. T. FERNALD

Chairmen of the meetings of the instructors of the several classes

Senior class: Professor MILLS
Junior class: Professor WELLINGTON
Sophomore class: Professor OSTRANDER
Freshman class: Professor BABSON

Admission

Every candidate for admission must be at least sixteen years of age, and must present a testimonial of good character from the principal of the last school that he attended.

FOUR-YEARS' COURSE

Candidates for admission to the freshman class will be received on certificate, as explained below, or on examination in the following subjects:

Algebra, through quadratics. Plane geometry. English. General history, Myers' *General History*. Civil government, Mowry's *Studies in Civil Government*. Physiology, Martin's *The Human Body*, briefer course. Physical geography.

This examination may be oral or written; the standard required for admission is 65 per cent. in each subject. Knowledge of the principles of arithmetic is presupposed, although an examination in this subject is not required. Inasmuch as it is found that candidates are frequently deficient in algebra and geometry, they are urged to obtain such drill in these subjects as shall secure accuracy and readiness in the application of principles to practical examples.

A candidate will not be accepted in English whose work is notably deficient in point of spelling, punctuation, phraseology, or division into paragraphs. The candidate will be required to present evidence of a general knowledge of the subject-matter of books named below, and to answer questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to test the candidate's power of clear and accurate expression, and will imply only a general knowledge of the substance of the books. The books set for examination in 1902 are: Shakespeare's *The Merchant of Venice;* Goldsmith's *The Vicar of Wakefield;* Scott's *Ivanhoe;* Cooper's *The Last of the Mohicans;* Lowell's *The Vision of Sir Launfal.*

The books set for examination in 1903 and 1904 are: Shakespeare's *The Merchant of Venice;* Goldsmith's *The Vicar of Wakefield;* Scott's *Ivanhoe;* Tennyson's *The Princess;* Lowell's *The Vision of Sir Launfal;* George Eliot's *Silas Marner.*

Examinations in one or more of the required subjects may be taken a year before the candidate expects to enter college, and credit for successful examination in any subject will stand for two years after the examination.

TIME, PLACES, AND ORDER OF EXAMINATIONS

The examinations for admission in 1902 will be held in the Botanic Museum of the Agricultural College, in Amherst, on Thursday and Friday, June 19 and 20, and on Tuesday and Wednesday, September 16 and 17, as follows:

First day:	8-30 A. M.	Registration
	9-00 A. M.	English
	11-00 A. M.	General history
	2-00 P. M.	Geometry
Second day:	9-00 A. M.	Civil government
	10-00 A. M.	Algebra
	2-00 P. M.	Physiology
	3-00 P. M.	Physical geography

Entrance examinations in June will be held on the same days and in the same order as in Amherst, at Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston, at Horticultural Hall, Worcester, and at Sedgwick Institute, Great Barrington. Candidates may be examined and admitted at any other time in the year.

ADMISSION ON CERTIFICATE

Certificates of schools and academies approved by the faculty of the college are accepted in place of examinations. These certificates must be made out on blanks furnished on application to the registrar, and must be signed by the principal of the school making such application.

A student admitted on certificate may be dropped from college at any time during freshman year, when his work is not satisfactory; and the privilege implied in the acceptance of a certificate may be revoked whenever, in the judgment of the faculty, the student, either through lack of ability or else of application, fails to attain the standard required.

ADMISSION TO ADVANCED STANDING

Candidates for classes more advanced than the freshman class will be examined in the studies which have been pursued by the class to which they desire admission.

Courses of Instruction

FOR THE DEGREE OF BACHELOR OF SCIENCE

AGRICULTURE

The various courses in this department aim to inculcate a knowledge of the scientific principles on which the various operations of the farm depend. Expressed more definitely, the aim is (a) to familiarize the student with the appearance, use, and adaptability of each of the types of farm animals, their management, the principles of breeding, and the economic handling of the more important products; and (b) to acquaint the student with the various facts concerning soils, methods of improvement of same, fertilization, crops, rural economy, and farm management. While industrial training is by no means overlooked, it is, however, upon scientific and theoretical training that especial emphasis is laid.

Instruction is given by means of mimeograph lecture notes, and textbooks when suitable, and by practical demonstration through the use of models, photographs, charts, lantern slides, live stock, and modern dairy apparatus; also by occasional excursions to the best neighboring herds.

The courses are as follows:

Freshman year, second semester, four hours per week; rural economics, history of agriculture, zoötechny: breeds of horses, cattle, sheep, swine. Professor COOLEY

Sophomore year, first semester, three hours per week; zoötechny: stock breeding, poultry farming, dairy farming. Shaw's *Animal Breeding*. Professor COOLEY

Second semester, four hours per week; agronomy: soils; formation, characteristics (chemical, physical, and biological), and methods of improvements, including drainage, tillage, irrigation. Professor BROOKS

Junior year, first semester, three hours per week; agronomy: manures and fertilizers, green manuring, crop rotation.
Professor BROOKS

Senior year (elective), first semester, five hours per week; agronomy: study of results of experiments (four weeks).
Professor BROOKS

Zoötechny: feeding animals and advanced dairy farming. Armsby's *Manual of Cattle Feeding*, Wing's *Milk and its Products*. Professor COOLEY

Second semester, five hours per week; agronomy: the crops of the farm, ensilage, rural economy, farm management.
Professor BROOKS

HORTICULTURE

The aim of this department is to teach the principles which relate to success in the cultivation of vegetables, fruits, flowers, and ornamental plants, shrubs and trees; to fit the student for the supervision of laborers engaged in the several branches of horticulture; to train those students who wish to make horticulture their life work. Especial attention is given to the practical training of students in the art of constructing and managing greenhouses; of the propagation of plants and trees either by means of seeds or cuttings, or by grafting or budding; of laying out, ornamenting, and caring for public or private grounds; and of forestry as adapted to the conditions in New England and in other parts of our country. New methods and the latest ideas are discussed and, so far as approved by experience, recommended.

Instruction in all the lines of horticulture is given by lectures, textbooks being used only as books of reference. Application of theory and methods is made in the field and the greenhouses as far as the time covered will allow.

The course is as follows:

Sophomore year, second semester, three hours per week; study of fruits and their culture. Professor MAYNARD

Junior year, both semesters, three hours per week; study of vegetables, market gardening, greenhouse construction and management, landscape gardening and forestry. Green's *Vegetable Gardening*. Professor MAYNARD

Senior year (elective), both semesters, eight hours per week; special instruction in fruit culture, market gardening, floriculture, landscape gardening, and forestry.

The senior subjects are taken under the heading of a "General Course" in horticulture, or all of the time may be devoted to one or two particular subjects. Professor MAYNARD

CHEMISTRY

This course aims to inculcate accurate observation, logical thinking, systematic and constant industry, together with a comprehensive knowledge of the subject. Instruction is given by textbook, lectures, and a large amount of laboratory work under adequate supervision. The laboratory work at first consists of a study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by a qualitative analysis of salts, minerals, soils, fertilizers, animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest such as the production of sugar, starch, and dairy products: the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders and foods; and the analysis of soils, waters, milk, wine, and other animal and vegetable products.

The courses are as follows:

Freshman year, second semester, two hours per week; general chemistry, part 1, principles of chemistry, non-metals. Newth's *Inorganic Chemistry*. Professor HOWARD

Sophomore year, first semester, four hours per week; general chemistry, part 2, metals. Professor HOWARD

Second semester, five hours per week; subject continued, dry analysis. Professor HOWARD

Junior year, first semester, four hours per week; qualitative and quantitative analysis, organic chemistry.
Professor WELLINGTON

Second semester, six hours per week; organic chemistry. Remsen's *Organic Chemistry*. Professor WELLINGTON

Senior year, (elective), first semester, three hours per week; chemical industries. Professor GOESSMANN

Eight hours per week; quantitative analysis and chemical physics. Reychler-McCrae's *Physical Chemistry*.
Professors WELLINGTON and HOWARD

Second semester, eight hours per week; advanced work with lectures. Professor WELLINGTON

GEOLOGY

This course is divided into two parts: mineralogy and geology.

Junior year, second semester, seven weeks, three hours per week; mineralogy: a course of systematic determinative mineralogy based on Brush's *Manual.* This work is carried on in the laboratory and consists in determining the minerals by a study of lustre, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests.
Professor HOWARD

Eleven weeks, three hours per week; geology: dynamical, structural, and historical, based on Scott's *Textbook of Geology*; illustrated by charts and fossils and by field excursions in the Connecticut valley. Professor LULL

Senior year, (elective), second semester, five hours per week; an extension of the course outlined above. More time is spent in the field and special attention is given to road-building materials, soils, and the important soil-forming rocks, and, as far as time permits, to general economic geology. Professor HOWARD

ZOÖLOGY

Sophomore year, first semester, three hours per week; Martin's *The Human Body* (advanced course) is used as a textbook, from which recitations are assigned, supplemented by lectures and demonstrations illustrated by means of anatomical models and charts. Professor LULL

Junior year, one semester and a half, six hours per week; laboratory study of the morphology of a series of typical animals paralleling a course of recitations based upon Parker and Haswell's *Manual of Zoölogy*, amplified and illustrated with charts, and the very complete series of specimens contained in the museum. Professor LULL

POLITICAL SCIENCE

The purpose of the entire course is to fit the student to understand the economic and political movements of his time, so that he may successfully solve the problems confronting him.

Economics, *senior year*, first semester, five hours per week. 1. The elements of political economy are taught by means of textbook (this year F. A. Walker's *Political Economy, Briefer Course*) and lectures, the aim being to make the student familiar with the generally accepted facts, definitions, principles and laws of the science; and to train him to criticise theories, scrutinize facts, and weigh arguments. 2. The industrial history of England and of the United States is studied. Gibbins' *Industrial History of England* is used. 3. The following elective courses are offered: economics of agriculture; banks and banking; problems of the currency; trusts, or monopolistic corporations; transportation; socialism. 4. Practical economics. Each member of the class selects for investigation a question, in which he is interested, and devotes two or three months to its solution.

Second semester, first seven weeks, five hours per week. Papers, giving the results of research, prepared by members of the class, are read, and discussed by the students. Each student is asked to explain and defend from criticism the statements and the conclusions made in the paper he presents. The department has at its disposal a working library and a collection of material for the use of students electing the course.

Professor Walker

Constitutional history, ten weeks, five hours per week. 1. Political institutions. By use of textbook (Woodrow Wilson's *The State*) and lectures, the student is led to understand what is the government, municipal, state, and federal, now existing in the United States. This government is compared and contrasted with the governments of England, France, and Germany. Care is taken to familiarize the student with the practical methods of legislation, of nominating conventions, of elections, and of administration. 2. Constitutional history of England and of the United States, with discussions relating to the origin, nature, scope, and purpose of government.

Professor Walker

Lectures on law, second semester, one hour per week. This course treats of laws relating to business, especially to business connected with rural affairs, citizenship, domestic relations, farming contracts, riparian rights, real estate, and common forms of conveyance. Practical work is required such as may fit one to perform the duties of a justice of the peace.

Mr. Lyman

ENGLISH

This department aims to secure: (a) ability to give oral and written expression of thought in correct, effective English; (b) acquaintance with the masterpieces of American and English literature; (c) ability to present, logically and forcibly, oral and written arguments on propositions assigned for debate.

Five courses are offered ranging as explained below from freshman year to senior year. The courses are as follows: Under (a) rhetoric and oratory; under (b) literature, American and English; under (c) argumentation; lastly, a special elective course in the senior year.

1 Rhetoric. This course extends through the two semesters of freshman year, three hours per week. It comprises, first, a study of the choice of words, the theory of phraseology, special objects in style, the sentence, the paragraph, and the

whole composition in its plan, arrangement, and development. The textbook used is Genung's *Outlines of Rhetoric*. Exercises and compositions are assigned suitably to enforce the principles taught. Secondly, a study of the literary types, description, narration, exposition, and argumentation, in which special attention is given to the training of the inventive ability of the student. The textbook used is Genung's *Working Principles of Rhetoric*. Professor BABSON

2 Oratory. Individual drill in declamation, first in private and then before the class, is given during both semesters of freshman and sophomore years. The choice of speakers for the Burnham prizes is based upon this work. In the junior year at least three orations, upon subjects assigned or chosen, are written, and delivered before the class. Every oration is criticised by the instructor before it is committed to memory by the student. The choice of speakers for the Flint prizes in oratory is based upon this work. Professor BABSON

3 Literature. American literature is studied in the first semester of sophomore year, three hours per week. The course comprises, first, the careful study of a textbook, (Pattee's *History of American Literature*), together with recitations based upon same ; secondly, the taking of notes from lectures, dwelling upon topics not fully treated in the textbook ; and thirdly, the reading outside of the class room of assigned selections from the prose and the poetical works of standard American authors. Professor BABSON

The history of English literature, first semester, four hours per week, second semester, two hours per week, is studied during the junior year. The work is based upon a textbook, this year Halleck's *History of English Literature*. The topical method is followed in recitation, and instead of formal lectures, there are informal discussions of points requiring a fuller development than the textbook gives. Collateral readings of literature are required. Frequent written tests are given in which particular attention is given to (a) the definition of words used in the textbook; (b) the use of English in the development of the topics unfolded in the textbook or discussed in the class room. Professor MILLS

4 Argumentation. Two hours per week during the two semesters of senior year are given to written and oral argumentation. The course is outlined as follows: (a) principles of argumentation as laid down in a textbook (this year McEwan's *Essentials of Argumentation*); (b) briefs and brief making; (c) briefs developed into forensics and submitted for personal criticism; (d) debates. Professor MILLS

Senior elective course, two hours per week. The work in this course is upon the following subjects: (a) English language, its origin, history, and development, with particular attention to the study of words as outlined in Johnson's *English Words*; (b), English literature, principally of the eighteenth and the nineteenth centuries, with a view to becoming familiar with the style and the thought of a few of their representative writers. Professor MILLS

VETERINARY SCIENCE

The course of instruction in veterinary science has been arranged to meet the demands of the students, who, after graduation, purpose following some line of work in practical agriculture. Particular stress is laid upon matters relating to the prevention of disease in animals. In addition, the interests of prospective students of human and comparative medicine have been taken into account in the arrangement of the course of study. The subject is taught by lectures, laboratory exercises, demonstration, and clinics.

Senior year, (elective), first semester, five hours per week; veterinary hygiene, comparative (veterinary) anatomy, general pathology. Professor PAIGE

Second semester, five hours per week; veterinary materia medica and therapeutics; theory and practice of veterinary medicine; general, special, and operative surgery; veterinary bacteriology and parasitology; medical and surgical clinics. Professor PAIGE

BOTANY

The object of this course is to teach those subjects which have a bearing upon economic and scientific agriculture. The undergraduate work extends through five semesters. The first three semesters are required. An outline of the course follows:

Freshman year, first semester, three hours per week; laboratory work and lectures. Study of the lower forms of plant life. Professor SMITH

Second semester, three hours per week; laboratory work, lectures, and textbook. Outlines of classification and morphology of the higher plants. Gray's *Manual of Botany*. Professor SMITH

Sophomore year, first semester; four hours per week; laboratory work and lectures. Structure and physiology of the higher plants. Professor SMITH

Senior year, (elective), both semesters, eight hours per week; laboratory work, lectures, and textbook. (a) Plant physiology, Darwin and Acton's *Practical Plant Physiology*. (b) Plant pathology. Either course is optional. Professor STONE

MATHEMATICS, PHYSICS, AND ENGINEERING

This department has charge of the instruction in mathematics, physics, civil engineering, and drawing. The aim is to secure thorough work in the fundamental principles and train the mind in clear and logical thinking. The application of the subjects to practical problems is given special attention. The work of the department extends over the four years as outlined below.

Freshman year, first semester, five hours per week; higher algebra, including ratio and proportion, progressive binomial theorem, series undetermined coefficients, logarithms, continued fractions, permutations. Wells' *College Algebra*.
Professor Hasbrouck

Free hand drawing, four hours per week. Mr. West

Second semester, two hours per week; solid geometry. Wells' *Solid Geometry*. Professor Hasbrouck

Plane trigonometry, two hours per week. Phillips and Strong's *Elements of Trigonometry*. Professor Ostrander

Sophomore year, first semester, four hours per week; elementary mechanics including uniform and accelerated motion, composition and resolution of forces, friction, work and energy, statics, and simple machines. Dana's *Elementary Mechanics*.
Professor Ostrander

Second semester, four hours per week; plane surveying with field work, including the use of the usual surveying instruments. Carhart's *Plane Surveying*. Professor Ostrander

Mechanical drawing, including elementary projection and shadows, four hours per week. Faunce's *Mechanical Drawing*.
Professor Hasbrouck

Junior year, first semester, three hours per week; physics, including mechanics of liquids, gases, sound, and heat. Carhart's *University Physics*. Professor Hasbrouck

Second semester, light and electricity with laboratory work.
Professor HASBROUCK

Senior year, (elective), first semester, five hours per week; analytic geometry and calculus. Nichol's *Analytic Geometry*.
Professor OSTRANDER

Engineering: roads and pavements, railroads, elementary mechanics of materials, five hours per week.
Professor OSTRANDER

Descriptive astronomy, four hours per week. Young's *General Astronomy*. Professor OSTRANDER

Second semester, five hours per week; differential and integral calculus. Osborn's *Calculus*. Professor OSTRANDER

Engineering: elementary structures, hydraulics, sanitary engineering, and masonry construction, five hours per week.
Professor OSTRANDER

ENTOMOLOGY

The importance of a knowledge of insects in every department of life is recognized by placing an introductory course in this subject as a required study in the junior year. For those who desire a further knowledge of it, because of it's importance to their future occupations, a senior elective is offered, so shaped as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry, or science teaching, as life occupations.

Junior year, last half of second semester, six hours per week; lectures, laboratory, and field work: general consideration of insect structure and life histories; systematic study of the groups of insects with particular reference to those of economic importance; methods for preventing or checking their ravages; insecticides and apparatus for their use; the collecting, mounting, and naming of insects, and examination of the work of insects in the field and laboratory. Professor H. T. FERNALD

Senior year, (elective), first and second semesters, eight hours per week; lectures, laboratory and field work: advanced morphology of insects; economic entomology; training in the determination of insects; use of literature on entomology; study of life histories; value and application of insecticides; thesis on insects most closely related to future occupation of the student. Professors C. H. FERNALD and H. T. FERNALD

MODERN LANGUAGES

French and German are required for one year, French occupying the freshman year, German, the sophomore year. An elective in advanced French and one in advanced German are offered in senior year.

FRENCH.—Course I. Required for the two semesters of freshman year, four hours per week, first semester; three hours per week, second semester. The aim of this course is to enable the student to read at sight ordinary French, especially that as found in scientific journals. The first six weeks are devoted to securing a working knowledge of the essentials of grammar. Reading is then begun and is continued throughout the year. The foundation in grammar is further strengthened by weekly exercises, with constant drill in composition. Mr. BABB

Course II. Elective for the two semesters of senior year, five hours per week. The aim of this course is to furnish a general knowledge of classical French literature. The reading is confined to masterpieces. Lectures on the history of French literature are offered. Drill is also furnished in composition, principles of syntax, and sight translation.

Edgren's *Complete French Grammar* is used as a guide in both courses.

Students electing Course II must have a good record in Course I, or must pass a satisfactory examination therein.

Mr. BABB

GERMAN.—Course I. Required for the two semesters of sophomore year, three hours per week. Facility in translation is the main object in view, with particular reference to scientific writings. The work consists of a study of the rudiments of grammar and of translation. Professor SMITH

Course II. Elective for the two semesters of senior year, five hours per week. In this course special attention is given to the reading of German literature, particularly the literature pertaining to several branches of natural science. A student taking this course in connection with any science is expected to gain the ability to avail himself of the German literature of his subject, within reasonable limits.

Different books are used from year to year, but the following list will give an idea of the nature of the work:

Course I. Joynes Meissner's *German Grammar*, Guerber's *Märchen und Erzählungen*, Hauff's *Das Kalte Herz*, Moser's *Der Bibliothekar*.

Course II. Lessing's *Emilia Galotti*, and *Minna von Barnhelm*, Hodge's Courses in *Scientific Reading*.

Students electing Course II must have a good record in Course I, or must pass a satisfactory examination therein.

Professor SMITH

MILITARY SCIENCE

In compliance with the provisions of an act of Congress, of July 2, 1862, military instruction under a regular army officer, detailed for this purpose, is required of all able bodied male students.

The object of such instruction is clearly to disseminate the elements of military knowledge throughout the country, that, in case of sudden emergency, a sufficient number of well trained, educated men may be found to command and properly to instruct volunteer troops. Military drill also has the object in view of giving the student physical exercise, teaching respect and obedience to those in authority, without detracting from pride of manhood, and developing a military bearing and courtesy becoming in a citizen as in a soldier.

Course I. Out of doors, an exercise of one hour, three times per week, Mondays, Tuesdays, and Thursdays: infantry drill by squad, company, and battalion; artillery drill by detachment; target practice; dress parade; review; guard duty.

All drills are in drill hall during the winter months and inclement weather.

Students assigned to the college band receive instruction and practice in band music and band evolutions, in place of drills and recitations.

Course II. Theoretical instruction for freshmen, one hour each week for both semesters, comprises recitations in infantry drill regulations. *United States Service Manual.*

Course III. Theoretical instruction for seniors for both semesters, one hour each week, embraces drill and army regulations; duties of sentinels and post duty; elements of military science; preparation of necessary reports and returns pertaining to a company of infantry; and a thesis on some military subject. Wagner's *Elements of Military Science.*

Professor ANDERSON

SYNOPSIS OF THE COURSES OF INSTRUCTION

Numbers indicate hours per week; those in parentheses, laboratory exercises.

FRESHMAN YEAR

First semester	
Rhetoric	3
Declamation	1
Structural botany	3
Advanced algebra	5
Free hand drawing	(4)
French	4
Military tactics	1
Second semester	
History of agriculture and breeding	4
General chemistry	2
Rhetoric	3
Declamation	1
Analytical botany	3
Geometry and trigonometry	4
French	4

SOPHOMORE YEAR

First semester	
Agriculture, breeding and live stock	3
General chemistry	(4)
Anatomy and physiology	3
American literature	3
Declamation	1
Economic botany	(4)
Mechanics	2
German	3
Second semester	
Soils, drainage, grasses	4
Horticulture	4
Quantitative analysis	(5)
Declamation	1
Surveying	3
Mechanical drawing	(4)
German	3

JUNIOR YEAR

First semester

Manures, fertilizers, rotation of crops		3
Market gardening		3
Qualitative and quantitative analysis		4
Zoölogy	2	(4)
English literature 4, Oratory 1,		5
Physics		3

Second semester

Landscape gardening		3
Organic chemistry	1	(5)
Geology		3
Zoölogy and entomology	2	(4)
English literature 2, Oratory 1,		3
Physics	2	(2)

SENIOR YEAR

First and second semesters. English, 2, military science, 1, and any one of the following combinations of subjects:

Agriculture	5	Agriculture	5
Political science	5	Chemistry	(8)
Veterinary science	5	German or French	5
Horticulture	(8)	Chemistry	(8)
Entomology	(8)	Astronomy (one semester)	4
Agriculture	5	Geology (one semester)	4
		Horticulture	(8)
Mathematics	5	Veterinary science	5
Engineering	5	Chemistry	(8)
Political science	5	German or French	5
Botany	(8)	Botany	(8)
Horticulture	(8)	Chemistry	(8)
English	5	Veterinary science	5
Entomology	(8)	English	5
Botany	(8)	Latin*	5
German or French	5	Mathematics	5

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*The choice of Latin as an elective presupposes at least two years' study of the subject.

When the schedule will permit, other combinations of the foregoing electives, if approved by the faculty, may be taken.

Military drill, 3, required throughout the four years.

COURSES OF INSTRUCTION

For the Degrees of Master of Science and Doctor of Philosophy

1 Honorary degrees are not conferred.

2 Applicants are not eligible to the degree of Master of Science until they have received the degree of Bachelor of Science or its equivalent.

3 The college offers a course of study in each of the following subjects: mathematics and physics, chemistry, agriculture, botany, horticulture, entomology, veterinary. Upon the satisfactory completion of any two of these the applicant receives the degree of Master of Science.

4 Candidates for the degree of Master of Science devote not less than one year and a half after graduation to the prosecution of two studies for the degree of Master of Science, one year of which must be in residence at the Massachusetts Agricultural College.

5 The degree of Doctor of Philosophy is conferred upon graduates of this college or other colleges of good standing, who spend three years at this institution and satisfactorily complete a major subject and two minor subjects. Botany, chemistry, or entomology may be selected as the major subject, and the minors available are botany, chemistry. entomology, and zoölogy. The amount and the quality of work done must be satisfactory to the professors in charge of the respective subjects before the degree is conferred.

6 The fee for the degree of Master of Science is ten dollars, and for the degree of Doctor of Philosophy, twenty-five

dollars, to be paid to the treasurer of the college before the degree is conferred.

Fees are also charged for the use of laboratories.

WINTER COURSES

For the benefit of those who are unable to take the regular four years' course, the college offers a series of short courses in agriculture, horticulture, botany, chemistry, zoölogy, and dairying. These courses are offered during the eleven weeks immediately following the Christmas vacation. They are open to persons of both sexes. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is required. Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

A tabulated outline of the courses, all of which are optional, follows:

AGRICULTURE

General Agriculture

1 Soils and operations upon them, drainage, irrigation, etc.
2 Farm implements and machinery
3 Manures and fertilizers
4 Crops of the farm, characteristics, management, etc.
5 Crop rotation
6 Farm book-keeping
7 Agricultural economics
8 Farm, dairy, and poultry management
Total hours 64

Animal Husbandry

1 Introduction
2 Location and soil
3 Building
4 Breeds of cattle*
5 Breeds of horses
6 Grain and fodder crops*
7 Foods and feeding*
Total hours 64

HORTICULTURE

Fruit Culture

1 Introduction
2 Propagation of fruit trees by seed, budding, grafting, forming the head, digging, planting, pruning, training, cultivation, etc.
3 Insects and fungous diseases
Total hours 32

Floriculture

1 Greenhouse construction and heating
2 Propagation of greenhouse and other plants by seed, cuttings, grafting, etc.
3 Cultivation of rose, carnation, chrysanthemum and orchids

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*With dairy course

Market Gardening

1 Introduction, equipment, tools, manures, fertilizers, etc.
2 Greenhouse construction and heating
3 Forcing vegetables under glass
4 Seed-growing by the market gardener
5 Special treatment required by each crop
6 Insects and fungi, with remedies
4 Propagation and care of greenhouse and bedding plants
5 Insects and fungi which attack greenhouse plants

Total hours, 27

Total hours 33

BOTANY

Injurious Fungi of the Farm, Garden, Greenhouse, Orchard, and Vineyard

1 Introduction
2 Nature and structure of rusts
3 Nature and structure of smuts
4 Nature and structure of mildews
5 Nature and structure of rots
6 Beneficial fungi of roots
7 Edible mushrooms

Total hours 22

Structure and Function of Plants

1 Introduction
2 The parts of a plant
3 Structure of the cell and plant in general
4 Functions of root, stem, and leaves
5 Food of plant obtained from air
6 Food of plant obtained from soil
7 Transference and elaboration of food
8 Growth of plants
9 Effects of light, moisture, heat, and cold
10 Root tubercles on pea and clover
11 Cross fertilization of flowers

Total hours 22

CHEMISTRY

General Agricultural Chemistry

1 Introduction
2 The fourteen elements of agricultural chemistry
3 Rocks and soils
4 The atmosphere
5 The chemistry of crop-growing
6 Fertilizers
7 Animal chemistry

Total hours 55

Chemistry of the Dairy

1 Introduction
2 The fourteen elements of agricultural chemistry
3 The physical properties of milk
4 Analysis of milk, butter, cheese, and other dairy products
5 Chemistry of the manufacture of dairy products

Total hours 55

ZOÖLOGY

General Zoölogy

Total hours 22

Entomology

1 Elementary principles
2 The important insect groups from an economic point of view
3 Serious insect pests of New England and how to control them

Total hours 33

DAIRYING

Especial emphasis is laid upon this course, the purpose of it being to give thorough training in the production and the management of home dairy products, as well as to equip butter makers for factory work. At the conclusion of this course certificates are given to students satisfactorily completing the assigned work.

Lectures and Class-room Work

1 The soil and crops
2 The dairy breeds and cattle breeding
3 Stable construction and sanitation, care of cattle
4 Common diseases of stock, their prevention and treatment
5 Foods and feeding
6 Book-keeping for the dairy farm and butter factory
7 Pasteurization and preparation of milk on physicians' prescriptions
8 Composition and physical peculiarities of milk: conditions which affect creaming, churning, methods of testing, and preservation
9 Milk testing
10 Butter making
11 Practice in aeration, pasteurization

Total hours 156

For further information regarding these winter courses address Professor William P. Brooks.

SPECIAL COURSES FOR WOMEN

By vote of the trustees, the college offers special elective courses open to women in such branches as botany, entomology, floriculture, fruit culture, market gardening, and the dairy.

Equipment of the Several Departments

AGRICULTURE

The part of the college estate, assigned to the department of agriculture contains 160 acres of improved land, 40 acres of pasture, and 16 acres of woodland. The latest inventions in improved agricultural tools and machinery are in practical use. The large and commodious barn and stables are stocked with the best breeds of horses, cattle, sheep, and swine. Attached to the barn is a dairy building equipped with the latest machinery driven by an electric motor. The museum contains a collection of implements, seeds, plants, and models of animals, all of which are designed to illustrate the evolution of agriculture. Three large lecture rooms, one in South College, and two in the dairy building have been assigned to this department.

HORTICULTURE

For illustration of the science and the practice of horticulture, the department possesses about 100 acres devoted to orchards, planted with all the leading old, and all new varieties of apples, pears, peaches, plums, Japanese and American cherries, quinces, chestnuts, hickory-nuts, and walnuts; vineyards containing nearly 200 named varieties of grapes, for sale, beside several hundred seedlings, and about an acre devoted to a commercial crop of a few market varieties; nurseries, containing all kinds of fruit and ornamental trees, shrubs, and plants, in all stages of growth, from the seed and cuttings to those ready for planting in the orchard or field; small fruit plantations containing valuable varieties, and showing the modern methods of training, pruning, and cultivation ; extensive greenhouses which contain, not only valuable collections of specimen plants, representing types of the flora of the world, but also the most valuable economic plants, such as the orange, banana, lemon, guava, pomegranate, sago palm, arrow-root, tapioca, ginger, pepper, tea, coffee, camphor, India rubber, Manila hemp, banyan tree, etc. All the common greenhouse and outdoor decorative plants are found, and small quantities of roses, carnations, chrysanthemums, and other commercial flowering plants are grown to illustrate the business of horticulture. All vegetable crops, now so largely grown under glass, are grown in limited quantities for purposes of instruction and for market.

For illustration in the work of landscape gardening, the grounds about the greenhouses, as well as that part of the grounds known as the Clark Park, are planted with a very large and complete collection of ornamental trees, shrubs, and plants.

For forestry there are two large groves of trees of varying ages, from those of almost primeval growth to the youngest seedlings, besides several plantations of younger growth either natural or planted ; and in the Botanic Museum there is a very complete collection of woods of Massachusetts.

All kinds of pumps and other appliances for distributing insecticides and fungicides as well as various modern tools and implements are in constant use. A small cold storage room makes possible the keeping of the products beyond their natural season and illustrates one of the most important adjuncts to the business of modern horticulture.

CHEMISTRY

This department has fourteen rooms well adapted to their special uses. They are supplied with a large assortment of apparatus and chemical materials. The lecture room on the second floor has a seating capacity for seventy students. Immediately adjoining it are four smaller rooms used for storing apparatus and preparing materials for the lecture table. The laboratory for beginners is a large room on the first floor furnished with forty working tables. Each table is provided with reagents and apparatus for independent work. A well filled laboratory for advanced work is also provided on the first floor. A weighing room has six balances and improved apparatus for determining densities of solids, liquids, and gases. The apparatus includes, besides balances, a microscope, a spectroscope, a polariscope, a photometer, a barometer, and numerous models and sets of apparatus. The various rooms are furnished with an extensive collection of industrial charts. A valuable and growing collection of specimens and samples, fitted to illustrate different subjects taught, is also provided. This includes rocks, minerals, soils, raw and manufactured fertilizers, foods, including milking products, fibres, and other vegetable and animal products, and artificial preparations of mineral and organic compounds. Series of preparations are used for illustrating the various stages of different manufactures from raw materials to finished product.

GEOLOGY

Geological teaching is illustrated by a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, models, and charts.

ZOÖLOGY

Zoölogical laboratory.—A large, well lighted room, situated. in the old chapel building, is fitted with necessary tables, trays, and general apparatus, microscopes, dissecting instruments, hand-lenses, and the like. There have lately been added aquaria, in which, as far as possible, the various types studied may be seen in their natural environment. A reference library is kept in the laboratory.

Zoölogical lecture room.—An ample lecture room is situated in South College, adjacent to the museum. It is supplied with a set of Leuckart charts and many special ones as well, and with a complete set of Auzoux models illustrative both of human and comparative anatomy. A special set of typical specimens are being set apart for class illustration, although the more extensive museum collection is drawn upon for the same purpose.

Museum of zoölogy.—The museum is mainly for the purpose of exhibiting those forms treated of in the lecture and laboratory courses, but, in addition to this, the aim has been to show as fully as possible the fauna of the Commonwealth and those types which show the evolution and the relationship of the members of the animal kingdom. The total number of specimens contained in the museum now exceeds eleven thousand. The museum is open to the public from 3-30 to 5-30 P. M., each week day.

Entomological laboratory.—The equipment for work in entomology during the senior year and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes, microtomes, reagents, and glass ware. One portion of the building is fitted up as a lecture room. Another room is devoted to library purposes, and contains a card-catalogue of over forty thousand cards, devoted to the literature of insects. In addition to a well selected list of entomological works in this room, the college library has an unusual number of rare and valuable books on this subject. This is supplemented by the private entomological library of the professor in charge, which contains over twenty-five hundred volumes, many of which cannot be found elsewhere in the United States. In another room is a large and growing collection of insects, both adult and in the early stages, which is of much assistance to the students. As the laboratory is directly connected with the insectary of the Hatch Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray pumps, nozzles, and other articles for the practical treatment of insects; the chemical room, fitted up for the analysis of insecticides, and other chemico-entomological work; and a greenhouse, where plants infested by injurious insects are under continual observation, and experimental treatment,—all these are available to the student. In addition, several private laboratory rooms and a photographing room with an unusually good equipment of cameras are provided. The large greenhouses, grounds, gardens, and orchards of the college are also to be mentioned under this head, providing as they do, a wide range of subjects for study of the attacks of injurious insects under natural conditions.

VETERINARY SCIENCE

The department has for its sole use a commodious and modern laboratory and hospital stable erected in 1899. Both buildings are constructed according to the latest ideas as regards sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease and to provide for effective heating, lighting, ventilation, and disinfection.

The laboratory building contains a large working laboratory for student use, and several small private laboratories for special work. In addition there is a lecture hall, museum, demonstration room, photographing room, and work shop. The hospital stable contains a pharmacy, operating hall, post-mortem and disinfecting room, besides a section for poultry, one for cats and dogs, and six sections separated from each other, for the accommodation of horses, cattle, sheep, swine, and other domestic animals.

The laboratory equipment consists of a dissecting Auzoux model of the horse, Auzoux models of the foot and the legs showing the anatomy and the diseases of every part. There are skeletons of the horse, cow, sheep, dog, and pig, and in addition a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts, and diagrams, which are made use of in connection with lectures and demonstrations.

The laboratories are supplied with the most modern, high power microscopes, microtomes, incubators, sterilizers, for the use of students taking the work in bacteriology and parasitology.

BOTANY

The botanical department possesses a general laboratory furnished with tables and benches for microscopical and physiological work and with a dark closet for photographic purposes. There are forty compound microscopes, twenty-three dissecting microscopes, a micro-photographic and landscape camera, and various accessories; also microtomes, paraffine baths, etc., for histological work; a large and useful collection of physiological apparatus for the study of photo-synthesis, respiration, metabolism, transpiration, heliotropism, geotropism, hydrotropism, galvanotropism, chemotropism, and other irritable phenomena connected with plants; a set of apparatus for the study of the mechanical constituents of the soil, and for experimental work in soil physics; a large and unique outfit of electrical appliances for the study of all phenomena related to electricity and plant-growing; various devices for the study of mechanics of plant structure; numerous contrivances to determine the power exerted by living plant organisms; several types of self-registering auxanometers used to measure the rate of growth of plants; self-registering thermometers, and hygrometers for recording constant changes in conditions.

A small special laboratory for graduate students is equipped with microscopes and other apparatus and reagents for advanced work.

Botanical lecture room.—The botanical lecture room adjoining the laboratory is adapted for general work in morphology and flower analysis with opportunity to use dissecting microscopes. It contains a moveable chart system arranged to display over 3000 figures relating to the structure and function of plants.

Botanical museum.—Directly over the botanical lecture room is a museum. It contains a collection of valuable material now undergoing rearrangement and enlargement. There is a collection of spraying solutions, spraying apparatus, together with noted examples of the results of spraying. There is an economic collection of seeds, a large number of models of fruits, the principal Massachusetts timber trees with photographs and sections of the same, and many cases of interesting examples of natural and artificial grafts, girdlings, etc.

Connected with the museum is a herbarium containing about 15,000 species of flowering plants and ferns, 1,200 species of mosses, 1,200 species of lichens and liverworts and 12,000 species of fungi, the latter collection being housed in the vegetable pathology building at the experiment station.

Adjacent to the botanical laboratory and lecture room are named collections of native and exotic trees. The various conservatories of the college and the experiment station representing over 13,000 square feet of ground surface devoted to the cultivation of a large variety of exotic plants are also available.

MATHEMATICS, PHYSICS, AND ENGINEERING

SURVEYING

The department possesses a considerable number of the usual surveying instruments with the use of which the students are required to become familiar by performing a required amount of field work. Among the larger instruments are two plain compasses, railroad compass with telescope, surveyor's transit, two engineer's transits with vertical arc and level, solar compass, omnimeter with verniers reading to ten seconds, adapted to geodetic work, Queen plane table, two wye levels, dumpy level, builder's level, sextant, hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For draughting, a vernier protractor, pantograph, parallel rule, etc., are available.

PHYSICS

Among the apparatus in use for general instruction in general physical processes may be found a set of United States standard weights and measures, precision balances, spherometer, vernier calipers, etc.; in mechanics, apparatus to illustrate the laws of falling bodies, systems of pulleys and levers, motion on an inclined plane, and the phenomena connected with the mechanics of liquids and gases. The usual apparatus for lecture illustration in heat, light, and sound are also in the possession of the department. In electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, among which may be enumerated a full set of Weston ammeters, and volt meters, a Carhart-Clark standard cell, Mascart quadrant electrometer, Siemens electro-dynamometer as well as self-reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistance.

MILITARY SCIENCE

In addition to a large campus, suitable for battalion drill, the military department possesses a special building in which there is a drill room 60 by 135 feet, an armory, a military recitation room, an office for the commandant, and a field-gun and gallery-practice room. The building also has a large bathroom immediately adjoining the armory.

In a plot of ground north of the college buildings there is a rifle range, marked for practice at distances of 100 and 200 yards. The range is furnished with a revolving target suitably protected by earthworks. The national government supplies, for the use of the department, arms and equipments: the Springfield cadet rifle and two breech-loading rifled steel guns, calibre 3.2, with complete equipments and ammunition.

The State supplies instruments for the college band.

Students are held responsible for all articles of public property while in their possession.

THE CHAPEL-LIBRARY BUILDING

One of the most attractive and commodious buildings belonging to the college is the stone chapel-library. It has a commanding position, approximately in the center of the group of buildings adjoining the campus. The chapel occupies the entire second story. A large room, capable of seating about four hundred, is used for daily prayers, Sunday services, the various commencement exercises, and not infrequently for lectures or social gatherings. The room has an excellent pipe organ. Two adjoining rooms are used for small religious gatherings, and meetings of the class teachers and the faculty. The rooms can be thrown open so as to become a part of the main audience hall.

The entire lower story is given over to the library. This library is available for reference or investigation, and is open daily, except on Sundays, from 8-00 o'clock A. M., to 5-30 o'clock P. M. and from 6-30 o'clock to 8-30 o'clock P. M. On Sundays it is open from 10 A. M. to 12 o'clock noon. The volumes at present number 22,506, classified as follows: useful arts, 8,327; natural sciences, 8,156; sociology, 2,337; history, 1,498; literature, 1,438; religion, 238; fine arts, 173; philosophy, 145; general works, 133; philology, 61. No pains are spared to make the library complete in the departments of agriculture, horticulture, botany, and of other natural sciences.

General Information

DORMITORIES

Students are expected to occupy rooms in the college dormitories unless excused to room elsewhere.

In North College and South College rooms, unfurnished, are arranged in suites of three. Each apartment consists of one study room and two bedrooms. In North College the corner rooms are 14 by 15 feet, and the annexed bedrooms 8 by 10 feet. The inside study rooms are $13\frac{1}{2}$ by $14\frac{1}{2}$ feet, and the bedrooms 8 by 8 feet. A coal stove is provided for each study room. The building is lighted by electricity. In South College the study rooms are 14 by 15 feet with a recess $7\frac{1}{3}$ by 3 feet, and the bedrooms $11\frac{1}{6}$ by $8\frac{5}{12}$ feet. The building is heated by steam and lighted by electricity.

Students are required to care for their rooms. Military inspection by the commandant takes place every Saturday morning at 8-30 o'clock.

Rent varies according to the building and location from $14 to $54 per year. Fuel or the use of steam varies from $5 to $13. Lights cost about $12 yearly.

Correspondence relative to the engaging of rooms should be addressed to Thomas Canavan, the janitor.

EXPENSES

Room rent, in advance . .	$14	$54
Board, $2.50 to $4 per week .	90	144
Fuel	5	15
Washing, 30 to 60 cents per week	11	22
Military suit . . .	12.50	20
Lights	12	12
Total	$144.50	$267

In addition to the above expenses, $80 tuition is charged to foreigners.

The military suit must be obtained immediately upon entering college, and used in the drill exercises prescribed. The following fees are charged for the maintenance of the several laboratories; chemical, $15 per semester used; zoölogical, $4 per semester used; botanical, $2 per semester used by sophomore class; $3 per semester used by senior class; entomological, $3 per semester used. Some expense is also incurred for textbooks.

THE LABOR FUND

An annual appropriation of $5000 is received from the State. The object of this fund is to assist those students who are dependent either wholly or in part on their own exertions, by furnishing them work in the several departments of the college. The greatest opportunity for such work is found in the agricultural, and the horticultural department.

Application for participation in the benefits of the labor fund should be made to the president of the college. Students desiring to avail themselves of its benefits must bring a certificate signed by one of the selectmen of the town in which they are resident, certifying to the fact that they require aid.

SELF HELP

Good opportunities are afforded for self support in part or in whole to those students who choose to avail themselves of them. But much depends upon the determination and the ability of the student applying for work. Some exceptional men have succeeded in paying their way through college. Not a few have paid a large share of their necessary expenses. Many have earned a small part of the cost of their college course. But in every case the student should have funds enough to pay his way until he can adapt himself to his new environment and show what he is capable of earning. The long summer vacation allows the student to earn good wages at home or elsewhere. There are no college exercises on Saturdays so that work for wages may then be performed. But no student should attempt to engage in work that will interfere with his success in his studies. The labor fund is employed in paying for the labor of students who require work, but the fund is limited and the college cannot promise employment to all applicants. Each case must be determined according to the circumstances of the time and the qualifications of the man.

RELIGIOUS SERVICES

Chapel services are held every week day at 8 A. M. and public worship in the chapel every Sunday at 9-25 A. M. Further opportunities for moral and religious culture are afforded by Bible classes taught by one of the professors and other teachers for an hour every Sunday afternoon, and by a religious meeting Thursday evening, under the auspices of the College Young Men's Christian Association.

SCHOLARSHIPS

ESTABLISHED BY PRIVATE INDIVIDUALS

Mary Robinson fund of one thousand dollars, the bequest of Miss Mary Robinson, of Medfield.

Whiting Street fund of one thousand dollars, the bequest of Whiting Street, Esq., of Northampton.

Henry Gassett fund of one thousand dollars, the bequest of Henry Gassett, Esq., of North Weymouth.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an Act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms of such application may be obtained from the president of the college.

Prizes

The following prizes are offered annually for proficiency in the work of several of the departments of collegiate study:

AGRICULTURE

The Grinnell prizes, the first of twenty-five dollars, and the second of fifteen dollars, given by the late Hon. William Claflin, of Boston, in honor of the late George B. Grinnell, Esq., of New York, to those members of the senior class who produce the best and the second best examinations, oral and written, in theoretical and practical agriculture.

BOTANY

The Hills prizes, the first of twenty dollars, and the second of ten dollars, given by the late Henry F. Hills, of Amherst, to those members of the senior class who produce the best and the second best herbariums. Also a prize of five dollars, to that student of the senior class who produces the best collection of native woods.

ENGLISH

The Burnham prizes, two first prizes of twenty-five dollars, and two second prizes of fifteen dollars, given by the late T. O. H. P. Burnham, of Boston, to members of the sophomore, and the freshman class, under certain restrictions, for excellence in declamation.

The Flint prizes, the first of thirty dollars, and the second of twenty dollars, given by Mr. Charles L. Flint, of Boston, of the class of 1881, to those members of the junior class, under certain restrictions, who produce the best and second best orations. Both composition and delivery are considered in making the award.

SPECIAL PRIZES

Special prizes are occasionally offered by various departments.

MILITARY DIPLOMAS

The commandant is authorized to give military diplomas countersigned by the president of the college to those men receiving the degree of Bachelor of Science who by their work in the military department during their course in college may have shown themselves worthy of distinction. These diplomas recommend those receiving them for commissions in the United States army or in the militia of the several states, vouching that they are fitted to fill the position of a commissioned officer.

WINTER COURSE PRIZES

The Dairy prizes, given by the Massachusetts Society for Promoting Agriculture, to members of the short winter course. Two sets of prizes are offered. The first set consists of three prizes of fifty, thirty, and twenty dollars, respectively, given for general excellence in all branches of the course as offered. The second set consists of three prizes of twenty-five, fifteen, and ten dollars, respectively, for excellence in the making of butter.

Award of Prizes

1900-1901

Grinnell Agricultural Prizes—Senior

First prize: Nathan Justin Hunting
Second prize: Ralph Ingram Smith

Hills Botanical Prizes—Senior

First prize: Clarence Everett Gordon
Second prize: Nathan Justin Hunting

Flint Oratorical Prizes—Junior

First prize: Howard Lawton Knight
Second prize: John Clifford Hall

Burnham Declamation Prizes—Sophomore and Freshman

First sophomore prize: William Warrington Peebles
Second sophomore prize: Harry James Franklin
First freshman prize: F. Dickinson Couden
Second freshman prize: J. William Gregg

Special Prize for Collection of Fungi—Senior

Dickran Bedross Tashjian

Special Prizes for Work in Chemistry—Junior

First prize: Edward Boyle Saunders
Second prize: Edmund Franklin McCobb

Military Honors—Senior

The following cadets were reported to the Adjutant General U. S. Army, and to the Adjutant General of Massachusetts, as having shown special aptitude for military service:

Nathan Davis Whitman
Alexander Cavassa Wilson
William Carlton Dickerman

Massachusetts Dairy Prizes—Winter Course

First set:
- First prize: Bertram Tupper
- Second prize: Benjamin Hawes Stackpole
- Third prize: Harlan Lewis Richardson

Second set:
- First prize: Archie Albert Crouch
- Second prize: Harry Gardner Richardson
- Third prize: Thomas Francis Hunt

Degrees Conferred in 1901

MASTER OF SCIENCE

Magna cum laude

Howard, Samuel Francis	Amherst

BACHELOR OF SCIENCE

Barry, John Cornelius†	Amherst
Bridgeforth, George Ruffin†*	Westmoreland, Ala.
Brooks, Percival Cushing†*	Brockton
Casey, Thomas†*	Amherst
Chickering, James Henry†*	Dover
Cooke, Theodore Frederic†*	Austerlitz, N. Y.
Dawson, William Alucius†*	Worcester
Dickerman, William Carlton†*	Taunton
Gamwell, Edward Stephen†*	Pittsfield
Gordon, Clarence Everett†	Clinton
Graves, Jr., Thaddeus†*	Hatfield
Henry, James Buel†*	Scitico, Conn.
Hunting, Nathan Justin†	Shutesbury
Leslie, Charles Thomas†*	Pittsfield
Ovalle Barros, Julio Moises†*	Santiago, Chili
Pierson, Wallace Rogers†*	Cromwell, Conn.
Rice, Charles Leslie†*	Pittsfield
Root, Luther Augustus	Deerfield
Schaffrath, Max	Waterbury, Conn.
Smith, Ralph Ingram†*	Leverett
Tashjian, Dickran Bedross*	Kharpoot, Turkey
Todd, John Harris†*	Rowley
Whitman, Nathan Davis†*	South Boston
Wilson, Alexander Cavassa†*	Boston

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†Received military diploma

*Received degree of B.Sc. from Boston University

Graduate Students

For the Degrees of M.Sc., and Ph.D.

Babb, George Francis A.M. Bates College 1901	Amherst
Ballou, Henry Arthur B.Sc. Massachusetts Agricultural College 1895	Amherst
Billings, George Austin B.Sc. Massachusetts Agricultural College 1895	South Deerfield
Haskins, Henri Darwin B.Sc. Massachusetts Agricultural College 1890	North Amherst
Heimburger, Lindley B.Sc. Florida Agricultural College 1901	DeLand, Fla.
Hinds, Warren Elmer B. Sc. Massachusetts Agricultural College 1899	Townsend
Ikeda, Hidezo A.B. University of Tokyo 1891	Tokyo, Japan
Morrill, Austin Winfield B.Sc. Massachusetts Agricultural College 1900	Tewksbury
Smith, Elizabeth Hight A.B. Smith College 1900	Amherst
Wiley, Samuel William B.Sc. Massachusetts Agricultural College 1898	Amherst
	Total 10

Special Students

Billings, Minerva Farrabee	South Deerfield
Russell, Ida Josephine	Amherst
Sanderson, Carrie May	Amherst
	Total 3

Under-Graduate Students

SENIOR CLASS

Belden, Joshua Herbert	*Newington, Conn.*	12 South College
Bodfish, Henry Look	*Tisbury*	20 South College
Carpenter, Thorne Martin	*Foxboro*	Hatch Experiment Station
Church, Frederick Richard	*Ashfield*	Mr. Wm. Billings'
Claflin, Leander Chapin	*Philadelphia, Pa.*	16 South College
Cook, Lyman Adams	*Millis*	Veterinary Laboratory
Cooley, Orrin Fulton	*So. Deerfield*	108 Pleasant St.
Dacy, Arthur Lincoln	*Boston*	Hatch Experiment Station
Dellea, John Martin	*No. Egremont*	Hatch Expt. Station
Dwyer, Chester Edwards	*Lynn*	Insectary
Gates, Victor Adolph	*Memphis, Tenn.*	11 South College
Hall, John Clifford	*Sudbury*	11 South College
Hodgkiss, Harold Edward	*Wilkinsonville*	28 North College
Kinney, Charles Milton	*Northampton*	16 South College
Knight, Howard Lawton	*Gardner*	Mr. Wm. Billings'
Lewis, Claude Isaac	*Unionville*	28 North College
McCobb, Edmund Franklin	*Milford*	17 South College
Morse, Ransom Wesley	*Belchertown*	24 North College
Paul, Herbert Amasa	*Lynn*	12 South College
Plumb, Frederic Henry	*Bridgeport, Conn.*	Mt. Pleasant
Saunders, Edward Boyle	*Southwick*	D. G. K. House
Smith, Samuel Leroy	*South Hadley*	86 Pleasant St.
West, David Nelson	*Northampton*	Mt. Pleasant

Total 23

JUNIOR CLASS

Allen, William Etherington	*Winthrop*	18 South College
Bacon, Stephen Carroll	*Leominster*	D. G. K. House
Barrus, George Levi	*Goshen*	D. G. K. House
Bowen, Howard Chandler	*Rutland*	6 North College
Brooks, Philip Whitney	*Cambridge*	Mr. Thomson's
Cook, Joseph Gershom	*Clayton*	Boarding Club
Franklin, Harry James	*Bernardston*	116 Pleasant St.
Halligan, Charles Parker	*Roslindale*	Tower, South College
Hood, William Lane	*Vandiver, Ala.*	32 North College
Jones, Gerald Denison	*South Framingham*	6 North College
Monahan, Neil Francis	*South Framingham*	Mr. Thomson's
Nersessian, Paul Nerses	*Marash, Turkey*	Boarding Club
Parsons, Albert	*North Amherst*	North Amherst
Peebles, William Warrington	*Washington, D. C.*	32 North College
Poole, Elmer Myron	*North Dartmouth*	5 South College
Proulx, Edward George	*Hatfield*	14 South College
Robertson, Richard Hendric	*Malden*	D. G. K. House
Snell, Edward Benaiah	*Lawrence*	Mr. Thomson's
Tinkham, Charles Samuel	*Roxbury*	D. G. K. House
Tottingham, William Edgar	*Bernardston*	12 North College
Tower, Winthrop Vose	*Melrose Highlands*	14 South College
West, Myron Howard	*Belchertown*	116 Pleasant St.

Total 22

SOPHOMORE CLASS

Ahearn, Michael Francis	*South Framingham*	Plant House
Back, Ernest Adna	*Florence*	12 North College
Barnes, Hugh Lester	*Stockbridge*	4 South College
Couden, Fayette Dickinson	*Amherst*	17 South College
Ellsworth, Frank Lawrence	*Holyoke*	10 South College
Elwood, Clifford Franklin	*Green's Farms, Conn.*	96 Pleasant St.
Esip, Edward Thomas	*Amherst*	23 Whitney St.
Fahey, John Joseph	*Pittsfield*	Mr. Thomson's
Fulton, Edwin Stanley	*Lynn*	108 Pleasant St.
Gay, Ralph Preston	*Stoughton*	21 North College
Gilbert, Arthur Witter	*Brookfield*	86 Pleasant St.
Gregg, John William	*South Natick*	112 Pleasant St.
Griffin, Clarence Herbert	*Winthrop*	18 South College
Haskell, Sidney Burritt	*Southbridge*	Professor Cooley's
Henshaw, Fred Forbes	*Templeton*	112 Pleasant St.
Lewis, Clarence Waterman	*Melrose Highlands*	2 North College
Newton, Howard Douglas	*Stockbridge*	4 South College
O'Hearn, George Edmund	*Pittsfield*	Mr. Thomson's
Parker, Sumner Rufus	*Brimfield*	Hatch Experiment Station
Peck, Arthur Lee	*Hartford, Conn.*	112 Pleasant St.
Pierce, Hervey Cushman	*West Millbury*	112 Pleasant St.
Quigley, Raymond Augustine	*Brockton*	2 North College
Raymoth, Reuben Raymond	*Goshen*	D. G. K. House
Smith, Walter Abbe	*Springfield*	96 Pleasant St
Staples, Parkman Fisher	*Westboro*	112 Pleasant St.
Tinker, Clifford Albion	*West Tremont, Me.*	D. G. K. House
White, Howard Morgan	*Springfield*	9 South College

Total 27

FRESHMAN CLASS

Adams, Richard Laban	*Jamaica Plain*	101 Pleasant St.
Allen, George Howard	*Somerville*	15 South College
Bartlett, Francis Alonzo	*Belchertown*	116 Pleasant St.
Belden, William Lucius	*North Hatfield*	9 North College
Brett, Clarence Elmer	*Brockton*	23 North College
Brigham, Fred Washington	*Ashburnham*	15 South College
Bruce, Ernest Charles	*Westboro*	101 Pleasant St.
Carter, Chester Merriam	*Leominster*	5 North College
Craighead, William Hunlie	*Boston*	25 North College
Crosby, Harvey Davis	*Rutland*	101 Pleasant St.
Cushman, Esther Cowles	*Northampton*	Northampton
Filer, Harry Burton	*Dwight*	25 North College
Gardner, John Joseph	*Milford*	14 North College
Goodenough, Herbert Harold	*Saratoga Springs, N. Y.*	13 South College
Graves, Edwin Langdon	*Hatfield*	5 North College
Haffenreffer, Adolf Frederick	*Jamaica Plain*	9 South College
Hall, Arthur William, Jr.	*North Amherst*	North Amherst
Hamblin, John Howland	*Falmouth*	2 South College
Hatch, Walter Bowerman	*Falmouth*	2 South College
Hill, Louis William	*Greenfield Hill, Conn.*	7 South College
Holcomb, Charles Sheldon	*Tariffville, Conn.*	9 North College
Hunt, Thomas Francis	*Amherst*	Hatch Expt. Station Barn
Huntington, Raymond Edwards	*Newton Centre*	34 Amity St.
Hutchings, Frank Farley	*South Amherst*	116 Pleasant St.
Ingham, Norman Day	*Granby*	112 Pleasant St.
Kelton, James Richard	*Orange*	19 Phillips St.
Knight, John Henry	*Middletown*	
Ladd, Edward Thorndyke	*Winchester*	6 South College
Ladd, Joseph Hartwell, Jr.	*Watertown*	6 South College
Lyman, John Franklin	*Amherst*	95 Main St.
Lyman, Richard Rowe	*Montague*	101 Pleasant St.
Merrill, Charles Edward, Jr.	*Melrose*	10 North College
Munson, William Anson	*Aurora, Ill.*	86 Pleasant St.
Newhall, Edwin White, Jr.	*San Francisco, Cal.*	96 Pleasant St.
O'Neil, William James	*Ayer*	97 Pleasant St.
Paige, George R.	*Amherst*	27 North College

Patch, George Willard	*Arlington Heights*	8 South College
Paul, Augustus Russell	*Framingham Centre*	96 Pleasant St.
Peck, Louis Edward	*South Egremont*	Boarding Club
Pray, Try Civille	*Natick*	11 North College
Porter, Charles Allen	*Boston*	
Ransehausen, Lyman Arthur	*Springfield*	84 North Pleasant St.
Rhodes, Elmer Elliot	*North Attleboro*	19 Phillips St.
Richardson, Justus Cutter	*Lowell*	96 Pleasant St.
Sanborn, Monica Lillian	*Salem*	44 Triangle St.
Sears, William Marshall	*Brockton*	23 North College
Smith, Robert Edward	*South Hadley Falls*	56 Pleasant St.
Sprague, Charles Eugene	*Boston*	96 Pleasant St.
Straw, Harold Douglass	*Guilford, Me.*	14 North College
Swain, Allen Newman	*New Dorchester*	116 Pleasant St.
Sykes, Charles Sumner	*Suffield, Conn.*	101 Pleasant St.
Taylor, Albert Davis	*Westford*	86 Pleasant St.
Tompson, Harold Foss	*Roxbury Crossing*	25 North College
Tinkham, Henry Buffington	*South Swansea*	10 North College
Tupper, Bertram	*West Newton*	5 South College
Walker, Lewell Seth	*Natick*	1 South College
Walsh, Thomas Frederick	*Ayer*	Pleasant St.
Whitaker, Chester Leland	*Somerville*	8 South College
Williams, Franklin Kinne	*Collinsville, Conn.*	96 Pleasant St.
Williams, Percy Frederic	*Natick*	1 South College
Willis, Grenville Norcott	*Becket*	13 South College
Yeaw, Frederick Loring	*Winthrop*	11 North College

Total 62

Winter Course, Class of 1901

Allen, George Howard	*Auburndale*
Bartlett, Dwight Stebbins	*Belchertown*
Billings, Harry Holmes	*Amherst*
Chase, Frank Wendell	*Westboro*
Child, William Chapin	*Woodstock, Conn.*
Crouch, Archie Albert	*Worcester*
Dickinson, Robert Joseph	*Woodbridge, Conn.*
Dunbar, Charles Earl	*Orange*
Eaton, Benjamin Ellis	*Brockton*
Gillette, Dwight Laing	*Cheshire, Conn.*
Gilson, Howard Luther	*Groton*
Hammond, Merle Kimball	*Onset*
Harlow, Ward Alvin	*Cummington*
Hunt, Thomas Francis	*Weston*
Mead, Philip Henry	*Silver Creek, N. Y.*
Munson, Edward Malcolm	*South Dartmouth*
Purves, Geoffrey Vaughan	*Bedford*
Raddin, Charles March	*Groton*
Richardson, Charles Henry	*Boxboro*
Richardson, Harry Gardner	*Woburn*
Richardson, Harlan Lewis	*West Acton*
Sawin, Ralph Dana	*Boston*
Scott, Alexander	*Boston*
Smith, Laurence Burleigh	*Groton*
Stackpole, Benjamin Hawes	*Hallowell, Me.*
Streeter, Charles William	*Ludlow Center*
Tupper, Bertram	*Barre Plains*
Whitney, Frank James	*North Amherst*
Williams, Carl Leslie	*North Orange*
Willis, George Washburn	*North Amherst*
Wood, Leroy Elisha Shore	*Upton*
Wright, Charles Wesley	*Worcester*
Yale, Walter Levi	*Meriden, Conn.*
Young, Alla Francis	*Gloucester*

Total 34

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Special	3	
Seniors	23	
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Total		178

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CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

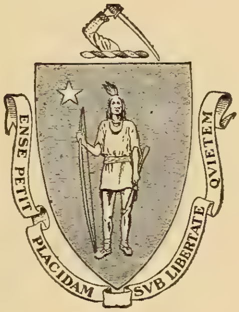
1902-1903

CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

1902-1903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AMHERST
PUBLISHED BY THE COLLEGE
1903

Calendar for 1902-1903

1902			
September	18	Thursday	First semester began at 8 A. M.
November	27	Thursday	Thanksgiving Day
December	18	Thursday	Holiday recess began
1903			
January	7	Thursday	8 A. M. Holiday recess ends
February	4	Wednesday	First semester ends
February	5	Thursday	8 A. M. Second semester begins
March	28	Saturday	Spring recess begins
April	2	Thursday	8 A. M. Spring recess ends
June	13	Saturday	Grinnell prize examination of senior class in Agriculture
June	14	Sunday	Baccalaureate sermon
June	15	Monday	Flint prize oratorical contest Burnham prize speaking
June	16	Tuesday	Meeting of the alumni Class day exercises, battalion drill, reception by the president and the trustees
June	17	Wednesday	Commencement exercises
June	18, 19	Thursday and Friday	8-30 A. M. Examinations for admission at Botanic Museum, Amherst; Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; Pittsfield; Horticultural Hall, Worcester

Vacation of Thirteen Weeks

September	17, 18	Tuesday and Wednesday	8-30 A. M. Examinations for admission, Botanic Museum
September	17	Thursday	8 A. M. First semester begins
November	26	Thursday	Thanksgiving Day
December	23	Wednesday	Holiday recess begins
1904			
January	6	Wednesday	8 A. M. Holiday recess ends

Origin, Object, and Location

The Massachusetts Agricultural College was among the first of the institutions to be established under the provisions of the National Land-Grant Act of 1862. This Act donated "public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." The framer of this bill was the late Senator Justin Smith Morrill of Vermont. At the present time over sixty institutions of higher learning in this country directly owe their origin or their prosperity to the benefits of this great educational measure.

The college was incorporated in 1864 by an Act of the State Legislature; and on the second of October, 1867, was formally opened to an entering class of thirty-three.

In January, 1875, an arrangement was made with the authorities of Boston University, whereby the college, without losing its independence, should thereafter become the "School of Agriculture" of the university. By means of this arrangement, students of the Massachusetts Agricultural College, besides obtaining the regular diploma of the college, which is accepted by American universities and by the University of Göttingen, in Germany, may, upon payment of a fee, and under certain conditions, receive the diploma in science awarded to graduates of the Boston institution. In 1882 the State Experiment Station was located on the college grounds. The station has since become connected with the college.

The college offers a free education to any American student who may be of good character and who may fulfil the requirements for admission. Women are admitted to the courses of the institution with a few exceptions on the same conditions as men. It also offers its course of study to foreign students upon payment by them of a tuition fee. It gives a four years' course leading to the degree of Bachelor of Science, and graduate courses leading to the degrees of Master of Science and of Doctor of Philosophy. It also offers a winter course of ten weeks, and a special course of two weeks in bee culture.

The college is situated in the beautiful town of Amherst. The grounds are especially attractive, and comprise over 400 acres of land, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent.

Amherst is ninety-seven miles west of Boston. It is on the line of the Southern Division (Central Massachusetts Railroad) of the Boston and Maine Railroad, as well as on that of the Central Vermont Railway. It is easily accessible.

The Corporation

	Term expires
HENRY S. HYDE, Springfield	1904
MERRITT I. WHEELER, Great Barrington	1904
WILLIAM R. SESSIONS, Springfield	1905
CHARLES L. FLINT, Brookline	1905
WILLIAM H. BOWKER, Boston	1906
GEORGE H. ELLIS, Boston	1906
J. HOWE DEMOND, Northampton	1907
ELMER D. HOWE, Marlborough	1907
NATHANIEL I. BOWDITCH, Framingham	1908
WILLIAM WHEELER, Concord	1908
ELIJAH W. WOOD, West Newton	1909
CHARLES A. GLEASON, New Braintree	1909
JAMES DRAPER, Worcester	1910
SAMUEL C. DAMON, Lancaster	1910

MEMBERS EX OFFICIO

His Excellency JOHN L. BATES
Governor of the Commonwealth

HENRY H. GOODELL
President of the College

FRANK A. HILL
Secretary of the Board of Education

JAMES W. STOCKWELL
Secretary of the Board of Agriculture

OFFICERS OF THE CORPORATION

His Excellency Governor JOHN L. BATES	Boston
President	
WILLIAM R. SESSIONS	Springfield
Vice-President	
JAMES W. STOCKWELL	Boston
Secretary	
GEORGE F. MILLS	Amherst
Treasurer	
CHARLES A. GLEASON	New Braintree
Auditor	

Board of Overseers

STATE BOARD OF AGRICULTURE

EXAMINING COMMITTEE OF OVERSEERS

John Bursley (Chairman)	West Barnstable
C. K. Brewster	Worthington
C. H. Shaylor	Lee
Alvan Barrus	Goshen
Warren C. Jewett	Worcester

Faculty

HENRY H. GOODELL, LL.D.
President of the College

LEVI STOCKBRIDGE
Professor of Agriculture, Honorary

CHARLES A. GOESSMANN, PH.D., LL.D.
Professor of Chemistry

CHARLES WELLINGTON, A.M., PH.D.
Associate Professor of Chemistry

CHARLES H. FERNALD, A.M., PH.D.
Professor of Zoölogy

REV. CHARLES S. WALKER, A.M., PH.D.
Professor of Political Science, Chaplain, and Secretary of the Faculty

WILLIAM P. BROOKS, PH.D.
Professor of Agriculture

GEORGE F. MILLS, A.M.
Professor of English and Latin

JAMES B. PAIGE, D.V.S.
Professor of Veterinary Science

GEORGE E. STONE, PH.D.
Professor of Botany

JOHN E. OSTRANDER, A.M., C.E.
Professor of Mathematics and Civil Engineering

HENRY T. FERNALD, PH.D.
Professor of Entomology

JOHN ANDERSON, CAPTAIN, U.S.A.
Professor of Military Science and Tactics

FRANK A. WAUGH, M.SC.
Professor of Horticulture

HERMAN BABSON, A.M.
Assistant Professor of English

FRED S. COOLEY, B.SC.
Assistant Professor of Agriculture

*RICHARD S. LULL, M.SC.
Associate Professor of Zoölogy, and Curator of the Zoölogical Museum

RALPH E. SMITH, B.SC.
Assistant Professor of Botany, and Instructor in German

PHILIP B. HASBROUCK, B.SC.
Assistant Professor of Mathematics and Physics

S. FRANCIS HOWARD, M.SC.
Assistant Professor of Chemistry

LOUIS R. HERRICK, B.SC.
Instructor in French

HOWARD L. KNIGHT, B.SC.
Instructor in Chemistry

GEORGE A. DREW, B.SC.
Instructor in Horticulture

FREDERICK B. LOOMIS, PH.D.
Instructor in Zoölogy

ARTHUR A. HARMON, D.V.S.
Instructor in Veterinary Science

DAVID N. WEST, B.SC.
Assistant in Mathematics

ROBERT W. LYMAN, LL.B.
Lecturer on Farm Law

E. FRANCES HALL
Librarian

**Absent on leave*

PHILIP B. HASBROUCK, B.SC.
Registrar

ELISHA A. JONES, B.SC.
Superintendent of Farm

NEWTON WALLACE
Electrician

P. E. NAYLOR
Steward of Dining Hall

Committees of the Faculty

Instruction: Professors MILLS, OSTRANDER, WELLINGTON, the REGISTRAR

Athletics: Professors PAIGE, BROOKS, ANDERSON, HOWARD

Catalogue: Professors WALKER, OSTRANDER, BABSON, the REGISTRAR

Entrance Examinations: Professors MILLS, LULL, BABSON, HASBROUCK

Rules: Professors WALKER, LULL, BABSON

Graduate Courses: Professors C. H. FERNALD, WELLINGTON, STONE, H. T. FERNALD

Schedule: Professors OSTRANDER, HASBROUCK

Dining Hall: Professors MILLS, HASBROUCK

Chairman of the meetings of the instructors of the several classes
Senior class: Professor MILLS
Junior class: Professor WELLINGTON
Sophomore class: Professor OSTRANDER
Freshman class: Professor BABSON

Admission

Every candidate for admission must be at least sixteen years of age, and must present a testimonial of good character from the principal of the last school that he attended.

FOUR-YEARS' COURSE

Candidates for admission to the freshman class will be received on certificate, as explained below, or on examination in the following subjects:

Algebra, through quadratics. Plane geometry. English. General history, Myers' *General History*. Civil government, Mowry's *Studies in Civil Government*. Physiology, Martin's *The Human Body*, briefer course. Physical geography.

This examination may be oral or written; the standard required for passing is 65 per cent. in each subject. Knowledge of the principles of arithmetic is presupposed, although an examination in this subject is not required. Inasmuch as it is found that candidates are frequently deficient in algebra and geometry, they are urged to obtain such drill in these subjects as shall secure accuracy and readiness in the application of principles to practical examples; furthermore no student found unsatisfactory in both of these subjects will be admitted to the college.

A candidate will not be accepted in English whose work is notably deficient in point of spelling, punctuation, phraseology, or division into paragraphs. The candidate will be required to present evidence of a general knowledge of the subject-matter of books named below, and to answer questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to test the candidate's power of clear and accurate expression, and will imply only a general knowledge of the substance of the books. The books set for examination in 1903 and 1904 are: Shakespeare's *The Merchant of Venice;* Goldsmith's *The Vicar of Wakefield;* Scott's *Ivanhoe;* Tennyson's *The Princess;* Lowell's *The Vision of Sir Launfal;* George Eliot's *Silas Marner.*

TIME, PLACES, AND ORDER OF EXAMINATIONS

The regular examinations for admission in 1903 will be held in the Botanic Museum of the Agricultural College, in Amherst, on Thursday and Friday, June 18 and 19, and on Tuesday and Wednesday, September 15 and 16, as follows:

First day:	8-30 A. M.	Registration
	9-00 A. M.	English
	11-00 A. M.	General history
	2-00 P. M.	Geometry
Second day:	9-00 A. M.	Civil government
	10-00 A. M.	Algebra
	2-00 P. M.	Physiology
	3-00 P. M.	Physical geography

Entrance examinations in June will be held on the same days and in the same order as in Amherst, at Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; at Horticultural Hall, Worcester, and at Pittsfield. Candidates may be examined and admitted at any other time in the year.

Preliminary examinations in one or more of the required subjects may be taken a year before the candidate expects to enter college, and credit for successful examination in any subject will stand for two years after the examination.

ADMISSION ON CERTIFICATE

Certificates of schools and academies approved by the faculty of the college are accepted in place of examinations. These certificates must be made out on blanks furnished on application to the registrar, and must be signed by the principal of the school making such application.

A student admitted on certificate may be dropped from college at any time during freshman year, when his work is not satisfactory ; and the privilege implied in the acceptance of a certificate may be revoked whenever, in the judgment of the faculty, the student, either through lack of ability or else of application, fails to attain the standard required.

ADMISSION TO ADVANCED STANDING

Candidates for classes more advanced than the freshman class will be examined in the studies which have been pursued by the class to which they desire admission.

Courses of Instruction

FOR THE DEGREE OF BACHELOR OF SCIENCE

AGRICULTURE

Introductory. Relations of federal and state governments to agriculture, four lectures. History of agriculture, tenure of land, rents, holdings, etc., six lectures.

Freshman year, first semester, three exercises a week in class room and one exercise a week in judging sheep and cattle, required; breeds of farm live stock, sheep, cattle. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.*

Professor COOLEY

Sophomore year, nine weeks, first semester, three exercises a week in class room and one exercise a week in judging horses and swine, required; horses and swine. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep, and Swine.*

Professor COOLEY

Sophomore year, nine weeks, first semester, three hours a week, required; dairying. Lectures on dairy farming, milk production, handling and marketing of milk, milk preservation and modification, and products of milk. Text-book, Wing's *Milk and Its Products.* Professor COOLEY

Sophomore year, eight weeks, second semester, three hours a week, required; animal breeding. Shaw's *Breeding Animals*, lectures and discussion of principles of breeding.

Professor COOLEY

Sophomore year, ten weeks, second semester, required; soils: formation, classification, composition; physical and chemical characteristics, and their relations to maintenance and increase in productiveness. Brooks' *Agriculture*, Vol. I, supplemented by lectures and laboratory work. Professor BROOKS

Junior year, fourteen weeks, first semester, elective; methods of soil improvement, including tillage, drainage, and irrigation. Brooks' *Agriculture*, Vol. I, supplemented by lectures, laboratory work, and practical exercises.

Professor BROOKS

Junior year, four weeks, first semester, elective; manures: production, composition, properties, adaptation and use. Brooks' *Agriculture*, Vol. II, supplemented by lectures and practical exercises.

Junior Year, second semester, elective; fertilizers, including a critical study of their production, composition, properties, adaptation and use; and green manuring. Brooks' *Agriculture*, Vol. II, supplemented by lectures, laboratory work and practical exercises. Professor BROOKS

Senior year, first semester, elective; silos and ensilage: historical development; the merits and methods of construction of the different kinds of silos; the crops suited for ensilage; ensilage machinery; the methods of filling the silo; and the nature and extent of the changes taking place in ensilage as affecting food value. Lectures, books of reference, and practical exercises. Professor BROOKS

Senior year, seven weeks, first semester, five hours a week, elective; feeding animals: principles of digestion and animal nutrition, a study of feeding stuffs (coarse and concentrated). The relation of food to product; compounding rations. Armsby's *Cattle Feeding*, lectures and discussion. Professor COOLEY

Senior year, seven weeks, first semester, five hours a week, elective; dairying: selection and management of the dairy farm, dairy cattle, chemical and physical properties of milk, etc., etc., cream, butter, cheese, and by-products.

Professor COOLEY

Senior year, first and second semesters, two exercises a week for ten weeks; dairy practice: use of separators, Babcock tester, butter making, etc. SPECIALISTS

Senior year, second semester, elective; the crops of the farm and crop rotation: including a study of the origin and agricultural botany of all the leading crops of the farm; annual forage crops, grasses and legumes, cereals, root-crops, vegetables, tobacco, and other special commercial crops. The production and use of each; the varieties and methods of improvement; the adaptation to soil; the special manurial requirements; and the methods of raising and harvesting are considered. Lectures, reference books, and field work.

Professor BROOKS

Senior year, second semester, elective; agricultural experimentation: objects, methods, sources of error; interpretation of results. Lectures and study of reports, bulletins, etc.

Professor BROOKS

Senior year, second semester, elective; farm management: selection of the farm, its subdivisions and equipment, buildings, fences, roads, water supply; farm capital, permanent, perishable, and floating. The labor of the farm and its management; farm power and farm machinery. Lectures and practical exercises. Professor BROOKS

Seminary courses, by arrangement, for advanced students.

Special problems requiring experiment or other research investigation will be assigned to students fitted for and desiring such work.

Training and practice in the use of farm implements and machines by arrangement when desired.

HORTICULTURE

This department endeavors to give the student a working knowledge of horticulture on its practical and on its scientific side. The attempt is made to inculcate a taste and an enthusiasm for horticultural pursuits, in place of distaste and dislike for the drudgery of farm life. On these things success and further progress chiefly depend.

The courses now offered are as follows, though others will be added as occasion requires.

1. *Sophomore class*, second semester. The fundamental operations of horticulture—propagation, pruning and cultivation—as related to the physiology of the plant. During the first half of this course Bailey's Nursery Book is used as a text.
Mr. Drew

2. *Junior year*, first semester. Pomology. This course covers the three natural divisions of the subject, viz.: (a) systematic pomology, or the study of the fruits themselves, (b) practical pomology, or the practice of fruit growing, (c), commercial pomology, or the principles underlying the marketing of fruits. The course is pursued by means of text book, lectures, laboratory and field exercises.
Professor Waugh and Mr. Drew

3. *Junior year*, first semester, four periods weekly. Plant breeding. Based on a thorough examination of the laws of heredity and of variation and of the principle theories of evolution. Lectures, accompanied by practice and direct experiments in crossing and hybridizing plants. Professor Waugh

4. *Junior year*, second semester, four periods weekly. Market gardening, including vegetables and small fruits. Locations, soils, methods of cultivation and marketing. Textbook Bailey's *Principles of Vegetable Gardening*, lectures and field exercises. Mr. DREW

5. Individual problems will be assigned to seniors who elect horticulture. This gives the student an opportunity for specialization in various lines of fruit growing, vegetable culture, greenhouse management, landscape gardening, etc.
Professor WAUGH, Mr. DREW and others

A seminar, made up of all students electing advanced work in horticulture or landscape gardening, meets at regular intervals for the discussion of any matters pertaining to the subject. Successful and noted horticulturists from outside the college are frequently present at these meetings to speak on the topics with which they are especially identified.

LANDSCAPE GARDENING

The college wishes to promote the work in landscape gardening in every way possible. The aim of the courses is to give the general student an understanding of the fundamental principles of design and of good taste as applied to gardening; and to prepare advanced students for the practice of landscape gardening in its various branches.

Although a variety of other work along related lines is available, the courses now definitely offered are as follows:

1. *Junior year*, four periods weekly. Materials. This course is designed to give the student an intimate acquaintance with the trees, shrubs and other plants used in landscape gardening. Professor WAUGH and assistant

2. *Junior year*, second semester, four hours a week. Elements of landscape design. The fundamental principles under-

lying the artistic development of parks, estates, gardens and other areas, together with some of the simpler applications to practical conditions. During the first half of the term Waugh's *Landscape Gardening* will be used as a text.

Professor WAUGH

3. *Senior year*, first and second semesters, four laboratory periods weekly. Advanced landscape gardening. Lectures, conferences, field exercises, and extensive practice work with criticism. The student is given definite problems to solve, these problems being arranged in such an order as to develop the subject logically in the student's mind.

Professor WAUGH and assistant

CHEMISTRY

This course aims to inculcate accurate observation, logical thinking, systematic and constant industry, together with a comprehensive knowledge of the subject. Instruction is given by textbook, lectures, and a large amount of laboratory work under adequate supervision. The laboratory work at first consists of a study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by a quantitative analysis of salts, minerals, soils, fertilizers, animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest, such as the production of sugar, starch, and dairy products; the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders and foods; and the analysis of soils, waters, milk, wine, and other animal and vegetable products.

The courses are as follows:

Freshman year, second half of second semester, four hours a week; general chemistry, part 1, principles of chemistry, nonmetals. Newth's *Inorganic Chemistry*. Professor HOWARD

Sophomore year, first semester, six hours a week; general chemistry, part 2, metals. Professor HOWARD

Second semester, five hours a week; subject continued, dry analysis. Professor HOWARD and Mr. KNIGHT

Junior year, first semester, eight hours a week; qualitative and quantitative analysis, organic chemistry. Four hours a week; special subject.
Professor WELLINGTON and Mr. KNIGHT

Second semester, ten hours a week; organic chemistry. Remsen's *Organic Chemistry*. Five hours a week; special subject. Professor WELLINGTON

Senior year, (elective), first semester, three hours a week; chemical industries. Professor GOESSMANN

Eight hours per week; quantitative analysis and chemical physics. Reychler-McCrae's *Physical Chemistry*.
Professors HOWARD and WELLINGTON

Second semester, eight hours a week; advanced work with lectures. Professor WELLINGTON

GEOLOGY

This course is divided into two parts: mineralogy and geology.

Junior year, first semester, seven weeks, three hours a week; mineralogy: a course of systematic determinative mineralogy based on Brush's *Manual*. This work is carried on in the laboratory and consists in determing the minerals by a study of lustre, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests.

Professor HOWARD

Eleven weeks, three hours a week; geology: dynamical, structural, and historical, based on Scott's *Textbook of Geology*; illustrated by charts and fossils and by field excursions in the Connecticut valley. Professor LULL

ZOÖLOGY

Anatomy and Physiology.—*Freshman year*, one half of the second semester, four hours a week. Martin's *The Human Body* (advanced course) is used as a textbook, from which recitations are assigned, supplemented by lectures and demonstrations illustrated by means of anatomical models and charts.

Professor LULL

Zoölogy, *Sophomore year*, first semester, two exercises of two hours each a week, laboratory and lecture course in general elementary Zoölogy. Parker and Haswell's *Manual of Zoölogy* will be used as a reference book in this course.

Professor LULL

Junior year, (elective for students in the biological course), first semester, four exercises of two hours each a week; second semester, three exercises of two hours each a week.

Professor LULL

POLITICAL SCIENCE

The purpose of the entire course is to fit the student to understand the economic and political movements of his time, so that he may succcessfully solve the problems confronting him.

Economics, *junior year*, second semester, four hours a week.

1. The elements of political economy are taught by means of textbook (this year F. A. Walker's *Political Economy, Briefer Course*) and lectures, the aim being to make the student familiar with the generally accepted facts, definitions, principles and laws of the science; and to train him to criticise theories, scrutinize facts, and weigh arguments. 2. The industrial history of England and of the United States is studied. Gibbins' *Industrial History of England* is used. 3. The following elective courses are offered: economics of agriculture; banks and banking; problems of the currency; trusts, or monopolistic corporations; transportation; socialism. 4. Practical economics. Each member of the class selects for investigation a question, in which he is interested, and devotes two or three months to its solution.

Papers, giving the results of research, prepared by members of the class, are read, and discussed by the students. Each student is asked to explain and defend from criticism the statements and the conclusions made in the paper he presents. The department has at its disposal a working library and a collection of material for the use of students.

Professor WALKER

Constitution of the United States, *senior year*, four hours a week during half of the first semester and the whole of the second semester. 1. Political institutions. By use of textbook (Woodrow Wilson's *The State*) and lectures, the student is led to understand what is the government, municipal, state, and federal, now existing in the United States. This government is compared and contrasted with the governments of England, France, and Germany. Care is taken to familiarize the student with the practical methods of legislation, of nominating conventions, of elections, and of administration. 2. Constitutional history of England and of the United States, with discussions relating to the origin, nature, scope, and purpose of government. Professor Walker

Lectures on law, second semester, one hour a week. This course treats of laws relating to business, especially to business connected with rural affairs, citizenship, domestic relations, farming contracts, riparian rights, real estate, and common forms of conveyance Practical work is required such as may fit one to perform the duties of a justice of the peace.
Mr. Lyman

ENGLISH

This department aims to secure: (a) ability to give oral and written expression of thought in correct, effective English; (b) acquaintance with the masterpieces of American and English literature; (c) ability to present, logically and forcibly, oral and written arguments on propositions assigned for debate.

The following courses are offered: under (a) rhetoric and oratory; under (b) American literature and English literature; under (c) argumentation. The elective course in senior year is in language and literature.

1. Rhetoric. This course extends through the two semesters of freshman year, and through the second semester of sophomore year. In the first semester of freshman year, work is confined to essay writing and to personal criticism, by the instructor, of the students' compositions. This criticism is offered at stated intervals to each student individually, according to a posted schedule of appointments. At the beginning of the semester a printed pamphlet is furnished each student, containing necessary information with regard to the preparation of essays. In the second semester of freshman year, the study of literary types is undertaken in the form of class-room

work in prose composition, including exposition, persuasion, narration, description, and in prose diction, including usage and style. Special attention is given to the training of the inventive ability of the student. The textbook used is Baldwin's *College Manual of Rhetoric.* In the second semester of sophomore year, individual work in essay writing is again taken up, largely based upon the previous work of the class in American literature. (See 3 below.) Here also personal criticism is offered. Professor BABSON

2. Oratory. Individual drill in declamation, first in private and then before the class, is given during the second semester of freshman year. The choice of speakers for the Burnham prizes is based upon this work. In the junior year, during the first semester, at least two orations, upon subjects assigned or chosen, are written, and delivered before the class. Every oration is criticised by the instructor before it is committed to memory by the student. The choice of speakers for the Flint prizes in oratory is based upon this work. Professor BABSON

3. Literature. American literature is studied in the first semester of sophomore year, three hours a week. The course comprises, first, the careful study of a textbook, (Newcomer's *American Literature*), together with recitations based upon same; secondly, the taking of notes from lectures, dwelling upon topics not fully treated in the textbook; and thirdly, the reading outside of the class room of assigned selections from the prose and poetical works of standard American authors.
Professor BABSON

The history of English Literature is studied during the second semester of sophomore year, four hours a week. The work is based upon a textbook, this year Halleck's *History of English Literature.* The topical method is followed in recitation, and instead of formal lectures, there are discussions of points requiring a fuller development than the textbook gives. Collateral readings of literature are required. Frequent written tests are given in which particular attention is given to (a) the definition of words used in the textbook; (b) the use of English in the development of the topics unfolded in the textbook or discussed in the class room. Professor MILLS

4. Argumentation. Four hours a week during the first semester of junior year are given to written and oral argumentation. The course is outlined as follows: (a) principles of argumentation as laid down in a textbook or by lecture; (b) briefs and brief making; (c) briefs developed into forensics and submitted for personal criticism; (d) debates.

Professor MILLS

Senior elective course, two semesters, four hours a week. The work in this course is upon the following subjects: (a) English language, its origin, history, and development, with particular attention to the study of words as outlined in Anderson's *A Study of English Words*; (b) English literature, principally of the eighteenth and nineteenth centuries.

Professor MILLS

VETERINARY SCIENCE

The course of instruction in veterinary science has been arranged to meet the demands of the students, who, after graduation, purpose following some line of work in practical agriculture. Particular stress is laid upon matters relating to the prevention of disease in animals. In addition, the interests of prospective students of human and comparative medicine have been taken into account in the arrangement of the course of study. The subject is taught by lectures, laboratory exercises, demonstration, and clinics.

Senior year, (elective), first semester, four hours a week; veterinary hygiene, comparative (veterinary) anatomy, general pathology. Professor PAIGE

Second semester, four hours a week; veterinary materia medica and therapeutics; theory and practice of veterinary medicines; general, special, and operative surgery; veterinary bacteriology and parasitology; medical and surgical clinics. Professor PAIGE

The instruction in bacteriology is given by means of lectures, recitations and laboratory exercises. The object of this course of study is to acquaint the student with the various organisms found in air, water, soil, milk, and the body, and their relation to such processes as decomposition, fermentation, digestion, and production of disease. The toxic substances resulting from the growth of organisms are considered, as well as the antitoxines used to counteract their action.

Senior year, half of the first semester, four exercises of two hours each a week. Required. Professor PAIGE

BOTANY

The object of this course is to teach those subjects which have a bearing upon economic and scientific agriculture. The undergraduate work extends through six semesters. The first two semesters are required. An outline of the course follows:

Freshman year, first semester, five hours a week; laboratory work and lectures. Histology and physiology of the higher plants. Professor SMITH

Freshman year, second semester, one laboratory exercise of two hours and one recitation hour a week; laboratory work, lectures, and textbook. Outlines of classification and morphology of the higher plants. Gray's *Manual of Botany*.

Professor SMITH

Junior year, first semester two laboratory exercises of two hours and one recitation hour a week; laboratory work and lectures. Crypto-gamic botany. Professor STONE or SMITH

Junior year, second semester, two laboratory exercises of two hours and one recitation hour a week; laboratory work and lectures. Elements of vegetable pathology and physiology.

Professor STONE or SMITH

Senior year, (elective), both semesters, four laboratory exercises of two hours a week; laboratory work, and lectures. (a) Plant physiology. (b) Plant pathology. Either course is optional. Professor STONE

MATHEMATICS, PHYSICS, AND ENGINEERING

This department has charge of the instruction in mathematics, physics, civil engineering, and drawing. The aim is to secure thorough work in the fundamental principles and train the mind in clear and logical thinking. The application of the subjects to practical problems is given special attention. The work of the department extends over the four years as outlined below.

MATHEMATICS

Freshman year, first semester, five hours a week; higher algebra, including ratio and proportion, progressive binominal theorem, series undetermined coefficients, logarithms, continued fractions, permutations. Wells' *College Algebra*.

Professor HASBROUCK and Mr. WEST

Second semester, two hours a week; solid geometry. Wells' *Solid Geometry.* Mr. WEST

Plane trigonometry, two hours a week. Phillips and Strong's *Elements of Trigonometry.* Professor HASBROUCK

Junior year, for mathematical and chemical students, first semester, four hours a week; analytic geometry of the line, circle, conic sections and higher plane curves. Wentworth or Bowser's *Analytic Geometry.* Professor OSTRANDER

Second semester, four hours a week; differential and integral calculus. Osborne's *Calculus.* Professor OSTRANDER

PHYSICS

Sophomore year, first semester, four hours a week; elementary mechanics of solids, liquids and gases, heat, and sound. Dana's *Elementary Mechanics*, Carhart's *University Physics.* Professor HASBROUCK

Second semester, four hours a week; electricity, magnetism, and light. Carhart's *University Physics.* Professor HASBROUCK

Senior year, elective for those stndents who have taken junior mathematics; first semester, four hours a week; analytic mechanics. Peck's *Analytic Mechanics.* Professor HASBROUCK

Second semester, four hours a week; laboratory work. Professor HASBROUCK

CIVIL ENGINEERING AND SURVEYING

Sophomore year, second semester, two exercises of two hours a week. Plain surveying with field work, including the use of the usual surveying instruments. *Surveying Manual*, Penn and Ketchum. Professor OSTRANDER

Instruction in Civil Engineering will be given in two distinct courses of one year each, the courses alternating. They will be open to students of the junior and senior classes as indicated below. The course of 1903-4 will be required of juniors and seniors taking the courses in mathematics and landscape gardening.

First semester, three hours recitation or lectures and two hours field work or draughting a week ; topographic and higher surveying, highway construction and the measurement of earth work pavements and railroad construction. Textbook and lectures. Professor OSTRANDER

Second semester, four hours a week ; strength of materials, foundations and masonry construction. Textbook and lectures. Professor OSTRANDER

The course for 1904-5 will be for students in mathematics only. First semester, three hours recitation and two hours draughting a week ; stresses in roofs, bridges and graphic statics. Merriman and Jacoby's *Roofs and Bridges*, Parts I and II. Professor OSTRANDER

Second semester, four hours a week; hydraulics and sanitary engineering. Merriman's *Hydraulics and lectures*. Professor OSTRANDER

DRAWING

Junior year, first semester, two two-hour sessions a week for students in mathematics and landscape gardening free hand drawing. Mr. WEST

Second semester, two two-hour sessions a week, mechanical and topographic drawing. Mr. WEST

ENTOMOLOGY

The importance of a knowledge of insects in every department of life is recognized by placing an introductory course in this subject as a required study in the junior elective courses—(1) agriculture, (2) horticulture, (3) biology, (4) landscape gardening. For those who desire a further knowledge of it, because of its importance to their future occupations, a senior elective is offered, so shaped as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry, or science teaching, as life occupations.

Junior year, second semester, four exercises a week, of two hours each; lectures, laboratory, and field work: general consideration of insect structure and life histories; systematic study of the groups of insects with particular reference to those of economic importance; methods for preventing or checking their ravages; insecticides and apparatus for their use; the collecting, mounting, and naming of insects, and examination of the work of insects in the field and laboratory.

Professor H. T. Fernald

Senior year, (elective), first and second semesters, four laboratory exercises of two hours each a week; lectures, laboratory and field work: advanced morphology of insects; economic entomology; training in the determination of insects; use of literature on entomology; study of life histories; value and application of insecticides; thesis on insects most closely related to future occupation of the student.

Professors C. H. Fernald and H. T. Fernald

MODERN LANGUAGES

French.—Course I. Requires for the two semesters of the freshman year, four hours a week, first semester; four hours a week, second semester. The aim of this course is to enable the student to read modern French fluently, especially that found in scientific journals and treatises. The first ten weeks are devoted to gaining a thorough mastery of the accent and such principles of grammar and syntax as are covered by the first half of Whitney's *French Grammar*. Great stress is laid upon the acquisition of a correct accent, a good vocabulary and a thorough comprehension of the main idiomatic difficulties of the language. This course is further strengthened by constant drill in pronunciation, exercises, and composition.

Mr. HERRICK

Course II. Elective for both semesters of the senior year, four hours a week. The aim of this course is to equip the student with a general knowledge of classical literature, and a working knowledge of the language as it is spoken and written in the French capital to-day. Drill is furnished in composition, principles of syntax, and sight translation. Students electing Course II must have a good record in Course I or must pass a satisfactory examination therein. Mr HERRICK

GERMAN.—Course I. Required for both semesters of sophomore year, four hours a week first semester; three hours a week second semester. Facility in translation is the main object in view, with particular reference to scientific writings. The work consists of a study of the rudiments of grammar and of translation. Professor SMITH

Course II. Elective for both semesters of senior year, four hours a week. In this course special attention is given to the reading of German literature, particularly the literature pertaining to several branches of natural science. A student taking this course in connection with any science is expected to gain the ability to avail himself of the German literature of his subject, within reasonable limits.

Different books are used from year to year, but the following list will give an idea of the nature of the work:

Course I. Joynes Meissner's *German Grammar*, Guerber's *Märchen und Erzählungen*, Hauff's *Das Kalte Herz*, Moser's *Der Bibliothekar*.

Course II. Lessing's *Emilia Galotti*, and *Minna von Barnhelm*, Hodge's Courses in *Scientific Reading*.

Students electing Course II must have a good record in Course I, or must pass a satisfactory examination therein.

Professor Smith

MILITARY SCIENCE

In compliance with the provisions of an act of Congress, of July 2, 1862, military instruction under a regular army officer, detailed for this purpose, is required of all able-bodied male students.

The object of such instruction is clearly to disseminate the elements of military knowledge throughout the country, that, in case of sudden emergency, a sufficient number of well trained, educated men may be found to command and properly to instruct volunteer troops. Military drill also has the object in view of giving the student physical exercise, teaching respect and obedience to those in authority, without detracting from pride of manhood, and developing a military bearing and courtesy becoming in a citizen as in a soldier.

Course I. Out of doors, an exercise of one hour, four times a week, Mondays, Tuesdays, Thursdays and Fridays: infantry drill by squad, company, and battalion; guard mounting, dress parade, inspection, and review; artillery drill by detachment; target practice.

All drills are in the drill hall during the winter months and inclement weather.

Students assigned to the college band are given instruction and practice in band music and band evolutions, in place of drills and recitations.

Course II. Theoretical instruction for freshmen, one hour a week for both semesters, comprises recitations in infantry drill regulations. *United States Service Manual.*

Course III. Theoretical instruction for seniors for both semesters, one hour a week, embraces drill and army regulations; duties of sentinels and guard duty; elements of military science; preparation of necessary reports and returns pertaining to a company of infantry; and a thesis on some military subject. Wagner's *Elements of Military Science.*

Professor ANDERSON

SYNOPSIS OF THE COURSES OF INSTRUCTION

The figures indicate the number of exercises a week; light faced type, recitation periods of one hour each; heavy faced type, laboratory periods of two hours each.

FRESHMAN YEAR

First Semester

Language	English	3
	French	4
Mathematics	Algebra	5
Science	Agriculture	4
	Botany **2**+1	3
Military	Tactics	1
History		2
		—22

Second Semester

Language	English	4
	French	4
Mathematics	Geometry and trigonometry,	4
Science	Anatomy and physiology half semester	4
	Chemistry half semester	
	Botany 1+1	2
History		2
		—20

SOPHOMORE YEAR

First Semester

Language	English	4
	German	4
Physics		4
Science	Agriculture	4
	Chemistry	3
	Zoölogy	2
		—21

Second Semester

Language	English	4
	German	3
Physics		4
Surveying		2
Science	Agriculture	3
	Chemistry	2½
	Horticulture	3
		—21½

JUNIOR YEAR

First Semester

Course in Agriculture	Agriculture	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	Horticulture	3
	English	4
		—20

Course in Horticulture	Horticulture	4
	Horticulture **1**+3	4
	Botany **2**+1	3
	Chemistry	**3**
	Geology	3
	English	4
		—21
Course in Biology	Zoölogy	**4**
	Botany **2**+1	3
	Chemistry	**3**
	Geology	3
	Horticulture	3
	English	4
		—20
Course on Chemistry	Chemistry	**4**
	Agriculture	4
	Mathematics	4
	Geology	3
	English	4
	Special subject	**2**
		—21
Course in Mathematics	Analytical geometry	4
	Engineering **1**+3	4
	Free hand drawing	2
	Landscape gardening	4
	Geology	3
	English	4
		—21
Course in Landscape Gardening	Landscape gardening	4
	Agriculture	3
	Botany **2**+1	3
	Free hand drawing	2
	Horticulture	3
	Geology	3
	English	4
		—22

Second Semester

Course in Agriculture	Agriculture	3
	Botany **2**+1	3
	Chemistry	**4**
	Horticulture	**2**
	Entomology	**4**
	Economics	4
		—20

Course in Horticulture	Horticulture	4
	Botany **2+**1	3
	Chemistry	**4**
	Landscape gardening	2
	Entomology	**4**
	Economics	4
		—21
Course in Biology	Entomology	**4**
	Zoölogy	**3**
	Botany **2+**1	3
	Chemistry	**4**
	Horticulture	**2**
	Economics	4
		—20
Course in Chemistry	Chemistry	**5**
	Agriculture	3
	Mathematics	4
	Economics	4
	Special subject	5
		—21
Course in Mathematics	Engineering	5
	Mathematics	4
	Mechanical drawing	**2**
	Landscape gardening	4
	Economics	4
		—19
Course in Landscape Gardening	Landscape gardening	4
	Botany, **2+**1	3
	Mechanical drawing	**2**
	Engineering	5
	Entomology	**4**
	Economics	4
		—22

SENIOR YEAR

First Semester

The following subjects are required in all courses:

Bacteriology, half semester **4** Constitution of the United States, half semester 4	4
Military science	1
	—5

Second Semester

Constitution of the United States	4
Military science	1
	—5

From the following the student must elect three courses, closely correlated with his junior year course. Only one course in language can be elected.

Agriculture	4
Horticulture	4
Veterinary	4
Botany	4
Landscape gardening	4
Entomology	4
Chemistry	4
Physics	4
Engineering	4
English	4
French	4
German	4
Latin	4

Courses of Instruction

FOR THE DEGREES OF MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY

Applicants are not eligible to the degree of Master of Science or of Doctor of Philosophy until they have received the degree of Bachelor of Science or its equivalent.

COURSES FOR THE DEGREE OF MASTER OF SCIENCE

A course of study is offered in each of the following subjects: mathematics and physics, chemistry, agriculture, botany, horticulture, entomology, veterinary science. Upon the satisfactory completion of any two of these the applicant receives the degree of Master of Science.

Candidates for the degree of Master of Science must devote not less than one year and a half after graduation to the prosecution of two studies for the degree, one year of which must be in residence at the Massachusetts Agricultural College.

COURSES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is conferred upon candidates who shall have spent three years in this institution and satisfactorily completed a major subject and two minor subjects. Botany, chemistry, entomology or horticulture may be selected as the major. The minors available are botany, chemistry, entomology, horticulture, and zoölogy.

At least three years is necessary to complete the work required: twenty hours per week to be devoted to the major subject, and from twelve to sixteen to be given to each minor during one and a half years.

A general outline of the work assigned for the major study in each subject is as follows:

BOTANY. Vegetable physiology, vegetable pathology, mycology, œcology, taxonomy, phylogeny, the history of botany and the history and theory of evolution. A thesis dealing with some economic problem in plant physiology or pathology, or both, and containing a distinct contribution to knowledge will also be required.

CHEMISTRY. Advanced work in the following subjects: inorganic analysis, qualitative, of the rarer elements, and quantitative; crystallography; physical chemistry; descriptive and determinative mineralogy; chemical geology; soil formation; soil physics and chemistry; gas analysis; synthetic inorganic work; chemical theory and history; general organic chemistry; special topics in organic chemistry; elementary quantitative organic analysis; proximate qualitative and quantitative organic analysis, including determination of organic radicles; organic synthesis of aliphatic and aromatic compounds; problems in chemical manufacture; recent chemistry of plant nutrition; animal physiological and pathological chemistry, including foods, standards for feeding of all kinds, and among secretions, milk and milk industries, and among excretions, urine and urinalysis; toxicology; insecticides and fungicides; frequent examinations on current chemical literature.

Early in the course original work on some agricultural, chemical subject must be begun. The history and results of this work must be submitted before graduation in the form of a thesis containing a distinct contribution to knowledge.

ENTOMOLOGY. *General morphology of insects:* embryology; life history and transformations; histology; phylogeny and relation to other anthropods; hermaphroditism; hybrids; parthenogenesis; paedogenesis; heterogamy; chemistry of colors in insects ; luminosity ; deformities of insects ; variation ; duration of life.

Œcology : dimorphism ; polymorphism ; warning coloration ; mimicry ; insect architecture ; fertilization of plants by insects ; instincts of insects ; insect products of value to man ; geographical distribution in the different faunal regions ; methods of distribution ; insect migrations ; geological history of insects ; insects as disseminators of disease ; enemies of insects, vegetable and animal, including parasitism.

Economic entomology : general principles ; insecticides ; apparatus ; special cases ; photography of insects and their work ; methods of drawing for illustrations ; field work on insects and study of life histories ; insect legislation.

Systematic entomology : history of entomology, including classifications and the principles of classifications ; laws governing nomenclature ; literature,—how to find and use it ; indexing literature ; number of insects in collections and in existence (estimated); lives of prominent entomologists ; methods of collecting, preparing, preserving, and shipping insects ; important collections of insects.

Journal club : assignments of the literature on the different groups of insects to different students who report at monthly meetings summaries of all articles of value which have appeared during the month.

Required readings of the best articles on the various topics named above and on the different orders of insects. This reading covers from 15,000 to 20,000 pages in English, French, and German, and the candidate is examined on this together with his other work at the close of his course.

Thesis : A thesis with drawings, which shall consist of the results of original investigation along one or several lines, and which shall constitute a distinct contribution to knowledge, must be completed and accepted before the final examinations are taken.

HORTICULTURE. The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation, and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself continuously to it. He will be required to attend lectures, conferences, and seminars, dealing with horticulture in its broader aspects. Advanced work will be required in the following subjects: systematic pomology, pomological practice; commercial practice; systematic, practical, and commercial olericulture; greenhouse plants and problems; floriculture; landscape gardening; plant breeding and general evolution; and questions of a physiological nature connected with propagation and pruning.

Other requirements and opportunities are (1) periodical semnars with special lectures, by prominent men from outside the college; (2) extensive and systematically planned readings; (3) frequent visits to orchards, gardens, greenhouses, estates, and libraries outside the college grounds, always with some definite purpose in view; (4) and finally, the preparation and publication of a thesis setting forth the results of the candidate's major study, which shall be an original and positive contribution to horticultural knowledge.

Courses of Instruction

FOR SPECIAL STUDENTS

A TWO YEARS' COURSE FOR WOMEN

Women are received who wish to pursue the studies named below. There is no charge for tuition. Board may be obtained in the Dining Hall and also rooms, so far as the accommodations will permit.

First year, first semester: soils, fertilizers and cultivation, four hours a week; elementary botany, five hours; French, four hours; free hand drawing, four hours.

Second semester: propagation and pruning (horticulture, one hour) three hours; botany: morphology, plant analysis, five hours; chemistry, descriptive, five hours; vegetable gardening, four hours; French, four hours.

Second year, first semester: pomology, three hours a week; greenhouse construction and management, three hours; botany: structure and physiology of plants, five hours; zoölogy, two hours; chemistry, five hours; German, four hours.

Second semester: landscape gardening, three hours a week; floriculture, four hours; vegetable pathology, five hours; entomology, three hours; chemistry, five hours; German, three hours.

A SHORT WINTER COURSE IN DAIRY FARMING

This course is open to persons of both sexes. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is required. Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

	Hours a week
Soils, tillage, and methods of soil improvement: manures and fertilizers and their use; crops and rotations	4
Breeds and breeding of dairy stock; judging to scale of points	2
Fodders and feeding farm live stock	1
Stable construction and sanitation	1
Common diseases of stock; prevention and treatment	1
Dairy products, their general characteristics, testing	2
Chemical composition of milk and of special milk products	1
Botany	2
Horticulture	3
Entomology	3
Dairy practice, including testing, use of separators, buttermaking, preparation of certified and modified milk and pasteurization	4
Practice in horticulture	1

Begins first Thursday in January and continues ten weeks.

A SHORT COURSE IN BEE CULTURE

This course begins the fourth Wednesday in May and continues two weeks.

	Total hours.
The structure of bees, with special reference to their work Professor H. T. Fernald	5
Flowers and fruits in their relations to bees Professor Stone	10
Honey crops and how to grow them Professor Brooks	5
Bees and bee keepers' supplies Professor Paige	10
Work in the apiary, under direction of an expert	20
Instruction by specialists	4

Equipment of the Several Departments

AGRICULTURE

The part of the college estate, assigned to the department of agriculture contains 160 acres of improved land, 40 acres of pasture, and 16 acres of woodland. The latest inventions in improved agricultural tools and machinery are in practical use. The large and commodious barn and stables are stocked with the best breeds of horses, cattle, sheep, and swine. Attached to the barn is a dairy building equipped with the latest machinery driven by an electric motor. The museum contains a collection of implements, seeds, plants, and models of animals, all of which are designed to illustrate the evolution of agriculture. Three large lecture rooms, one in South College, and two in the dairy building have been assigned to this department.

HORTICULTURE AND LANDSCAPE GARDENING

For illustration of the science and the practice of horticulture, the department possesses about 100 acres devoted to orchards, planted with the leading old and new varieties of apples, pears, peaches, plums, cherries, quinces, chestnuts, hickory-nuts, and walnuts; vineyards containing nearly 200 named varieties of grapes, besides many seedlings, and about an acre devoted to a commercial crop of a few market varieties; nurseries containing many kinds of fruit and ornamental trees, shrubs, and plants, in all stages of growth, from the seed and cuttings to those ready for planting out; and small fruit plantations of considerable diversity and extent. Several acres of excellent garden land are devoted to the growing of all the common types of vegetables. All these plantations, as far as possible, are managed according to the best practical and commercial methods, so that students may learn to know not merely the plants themselves but the best methods of handling them at a profit.

There are large well stocked glass houses to illustrate the principles of greenhouse construction and management. These houses contain a large collection of the economic plants of the world; and also small commercial supplies of those plants such as carnations, roses, and chrysanthemums, commonly grown for market. Vegetable growing under glass is practiced to an extent necessary for purposes of illustration.

A fine arboretum of trees and shrubs, native and exotic, furnishes material for the study of students in landscape gardening. Gardens of hardy and tender plants are being continually extended. Actual work in practical landscape gardening, laying drives and walks, planning and planting various areas, is constantly in progress on the college campus.

CHEMISTRY

This department has fourteen rooms well adapted to their special uses. They are supplied with a large assortment of appartus and chemical materials. The lecture room on the second floor has a seating capacity for seventy students. Immediately adjoining it are four smaller rooms used for storing apparatus and preparing materials for the lecture table. The laboratory for beginners is a large room on the first floor furnished with forty working tables. Each table is provided with reagents and apparatus for independent work. A well filled laboratory for advanced work is also provided on the first floor. A weighing room has six balances and improved apparatus for determining densities of solids, liquids, and gases. The apparatus includes, besides balances, a microscope, a spectroscope, a polariscope, a photometer, a barometer, and numerous models and sets of apparatus. The various rooms are furnished with an extensive collection of industrial charts. A valuable and growing collection of specimens and samples, fitted to illustrate different subjects taught, is also provided. This includes rocks minerals, soils, raw and manufactured fertilizers, foods, including milk products, fibres, and other vegetable and animal products, and artificial preparations of mineral and organic compounds. Series of preparations are used for illustrating the various stages of different manufactures from raw materials to finished product.

GEOLOGY

Geological teaching is illustrated by a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, models, and charts.

ZOÖLOGY

Zoölogical laboratory.—A large, well lighted room, situated in the chemical laboratory, is fitted with necessary tables, trays, and general apparatus, microscopes, dissecting instruments, hand-lenses, and the like. There have lately been added aquaria, in which, as far as possible, the various types studied may be seen in their natural environment. A reference library is kept in the laboratory.

Zoölogical lecture room.—An ample lecture room is situated in South College, adjacent to the museum. It is supplied with a set of Leuckart charts and many special ones as well, and with a complete set of Auzoux models illustrative both of human and comparative anatomy. A special set of typical specimens are being set apart for class illustration, although the more extensive museum collection is drawn upon for the same purpose.

Museum of zoölogy.—The museum is mainly for the purpose of exhibiting those forms treated of in the lecture and laboratory courses, but, in addition to this, the aim has been to show as fully as possible the fauna of the Commonwealth and those types which show the evolution and the relationship of the members of the animal kingdom. The total number of specimens contained in the museum now exceeds eleven thousand. The museum is open to the public from 3-30 to 5-30 P. M., each week day.

Entomological laboratory.—The equipment for work in entomology during the senior year and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes, microtomes, reagents, and glass ware. One portion of the building is fitted up as a lecture room. Another room is devoted to library purposes, and contains a card-catalogue of over forty thousand cards, devoted to the literature of insects. In addition to a well selected list of entomological works in this room, the college library has an unusual number of rare and valuable books on this subject. This is supplemented by the private entomological library of the professor in charge, which contains over twenty-five hundred volumes, many of which cannot be found elsewhere in the United States. In another room is a large and growing collection of insects, both adult and in the early stages, which is of much assistance to the students. As the laboratory is directly connected with the insectary of the Hatch Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray pumps, nozzles, and other articles for the practical treatment of insects; the chemical room, fitted up for the analysis of insecticides, and other chemico-entomological work; and a greenhouse, where plants infested by injurious insects are under continual observation, and experimental treatment,—all these are available to the student. In addition, several private laboratory rooms and a photographing room with an unusually good equipment of cameras are provided. The large greenhouses, grounds, gardens, and orchards of the college are also to be mentioned under this head, providing, as they do, for study a wide range of subjects relating to the attacks of injurious insects under natural conditions.

VETERINARY SCIENCE

The department has for its sole use a commodious and modern laboratory and hospital stable erected in 1899. Both buildings are constructed according to the latest ideas as regards sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease and to provide for effective heating, lighting, ventilation, and disinfection.

The laboratory building contains a large working laboratory for student use, and several small private laboratories for special work. In addition there are a lecture hall, museum, demonstration room, photographing room, and work shop. The hospital stable contains a pharmacy, operating hall, post-mortem and disinfecting room, besides a section for poultry, one for cats and dogs, and six sections separated from each other, for the accommodation of horses, cattle, sheep, swine, and other domestic animals.

The laboratory equipment consists of a dissecting Auzoux model of the horse, Auzoux models of the foot and the legs, showing the anatomy and the diseases of every part. There are skeletons of the horse, cow, sheep, dog, and pig, and in addition a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts, and diagrams, which are made use of in connection with lectures and demonstrations.

The laboratories are supplied with the most modern, high power microscopes, microtomes, incubators, sterilizers, for the use of students taking the work in bacteriology and parasitology.

BOTANY

The botanical department possesses a general laboratory furnished with tables and benches for microscopical and physiological work and with a dark closet for photographic purposes. There are forty-six compound microscopes, thirty dissecting microscopes, a micro-photographic and landscape camera, and various accessories ; also microtomes, paraffine baths, etc., for histological work ; a large and useful collection of physiological apparatus for the study of photo-synthesis, respiration, metabolism, transpiration, heliotropism, and other irritable phenomena connected with plants ; a set of apparatus for the study of the mechanical constituents of the soil, and for experimental work in soil physics ; a large and unique outfit of electrical appliances for the study of all phenomena related to electricity and plant-growth ; various devices for the study of mechanics of plant structure ; several types of self-registering auxanometers used to measure the rate of growth of plants ; self-registering thermometers, and hygrometers for recording constant changes in conditions.

Botanical lecture room.—The botanical lecture room adjoining the laboratory is adapted for general work in morphology and flower analysis with opportunity to use dissecting microscopes.

Botanical museum.—Directly over the botanical lecture room is a museum. It contains a collection of valuable material now undergoing rearrangement and enlargement. There is a collection of spraying solutions ; an economic collection of seeds, the principal Massachusetts timber trees, with photographs and sections of the same, and many cases of interesting examples of natural and artificial grafts, girdlings, etc.

Connected with the museum is a herbarium containing about 15,000 species of flowering plants and ferns, 1,200 species of mosses, 1,200 species of lichens and liverworts, and 12,000 species of fungi, the latter collection being housed in the vegetable pathology building at the experiment station.

Adjacent to the botanical laboratory and lecture room are named collections of native and exotic trees. The various conservatories of the college and the experiment station representing over 13,000 square feet of ground surface devoted to the cultivation of a large variety of exotic plants are also available.

MATHEMATICS, PHYSICS, AND ENGINEERING

SURVEYING

The department possesses a considerable number of the usual surveying instruments with the use of which the students are required to become familiar by performing a required amount of field work. Among the larger instruments are two plain compasses, railroad compass with telescope, surveyor's transit, two engineer's transits with vertical arc and level, solar compass, omnimeter with verniers reading to ten seconds, adapted to geodetic work, Queen plane table, two wye levels, dumpy level, builder's level, sextant, hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For draughting, a vernier protractor, pantograph, parallel rule, etc., are available.

PHYSICS

Among the apparatus in use for general instruction in general physical processes may be found a set of United States standard weights and measures, precision balances, spherometer, vernier calipers, etc.; in mechanics, apparatus to illustrate the laws of falling bodies, systems of pulleys and levers, motion on an incline plane, and the phenomena connected with the mechanics of liquids and gases. The usual apparatus for lecture illustration in heat, light, and sound are also in the possession of the department. In electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, among which may be enumerated a full set of Weston ammeters, and volt meters, a Carhart-Clark standard cell, Mascart quadrant electrometer, Siemens electro-dynamometer as well as self reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistance.

MILITARY SCIENCE

In addition to a large campus, suitable for battalion drill, the military department possesses a special building in which there is a drill room 60 by 135 feet, an armory, a military recitation room, an office for the commandant, and a field-gun and gallery practice room. The building also has a large bathroom immediately adjoining the armory.

In a plot of ground north of the college buildings there is a rifle range, marked for practice at distances of 100 and 200 yards. The range is furnished with a revolving target suitably protected by earthworks. The national government supplies, for the use of the department, arms and equipments: the Springfield cadet rifle and two breech-loading rifled steel guns, calibre 3.2, with complete equipments and ammunition.

The State supplies instruments for the college band.

Students are held responsible for all articles of public property while in their possession.

THE CHAPEL-LIBRARY BUILDING

One of the most attractive and commodious buildings belonging to the college is the chapel-library. It has a commanding position, approximately in the center of the group of buildings adjoining the campus. The chapel occupies the entire second story. A large room, capable of seating about four hundred, is used for daily prayers, Sunday services, the various commencement exercises, and not infrequently for lectures or social gatherings. The room has an excellent pipe organ. Two adjoining rooms are used for small religious gatherings, and meetings of the class teachers and the faculty. The rooms can be thrown open so as to become a part of the main audience hall.

The entire lower story is given over to the library. This library is available for reference or investigation, and is open daily, except on Sundays, from 8 A.M. to 5 P.M. and from 6-30 to 8-30 P. M. It is open on Sundays from 10 A. M. to 1 P. M. The volumes at present number 23,804. The library contains carefully selected books in the departments of agriculture, horticulture, botany, entomology, and of other natural sciences. Sociology, economics, history, literature, the fine arts, and the useful arts are well represented. Constant additions will be made to secure the latest and best works in the several departments of learning.

DINING HALL

A colonial dining hall, built of brick and equipped with all modern conveniences, was completed and opened February, 1903, for the accommodation of students. A committee composed of two members of the faculty, two members of the student body, and the steward, manages the affairs of the dining hall.

The hall contains a number of suites of rooms which may be secured for occupancy by young women attending any of the departments of the college.

THE HEATING, LIGHTING, AND POWER PLANT

This plant is located in the ravine near the chemical laboratory. It is equipped with two large boilers, an engine, and an electric generator. Here steam is generated which heats the college buildings on the west side of the public highway, extending from the dining hall to veterinary laboratory. Here also is produced the electricity which lights all the buildings and the the grounds of the college. Electric power is also generated which is used to drive the machinery in the dairy and in the barn. Connected with the plant is a machine shop in which much work is done for the college. This plant affords opportunity for students in mechanical and electrical engineering to observe the modern utilization of steam and of electricity.

General Information

DORMITORIES

Students are expected to occupy rooms in the college dormitories unless excused to room elsewhere.

In North College and South College rooms, unfurnished, are arranged in suites of three. Each apartment consists of one study room and two bedrooms. In North College the corner rooms are 14 by 15 feet, and the annexed bedrooms 8 by 10 feet. The inside study rooms are $13\frac{1}{2}$ by $14\frac{1}{2}$ feet, and the bedrooms 8 by 8 feet. In South College the study rooms are 14 by 15 feet with a recess $7\frac{1}{3}$ by 3 feet, and the bedrooms $11\frac{1}{6}$ by $8\frac{5}{12}$ feet. Both buildings are heated by steam and lighted by electricity.

Students are required to care for their rooms. Military inspection by the commandant takes place every Saturday morning at 8-30 o'clock.

Rent varies according to the building and the location from $15 to $45 a year. Steam heat costs $13 yearly. Lights cost $12 yearly.

Correspondence relative to the engaging of rooms should be addressed to Thomas Canavan, the janitor.

EXPENSES

Room rent, in advance .	$15	$45
Board, $3.25 to $4 per week .	117	144
Fuel	13	13
Washing, 30 to 60 cents a week	11	22
Military suit . . .	12.50	20
Lights	12	12
	$180.50	$256

In addition to the above expenses, $80 tuition is charged to foreigners.

The military suit must be obtained immediately upon entering college, and used in the drill exercises prescribed. The following fees are charged for the maintenance of the several laboratories : chemical, $15 per semester used ; zoological, $4 per semester used ; botanical, $2 per semester used by sophomore class ; $3 per semester used by senior class ; entomological, $3 per semester used. Some expense is also incurred for textbooks.

THE LABOR FUND

An annual appropriation of $5000 is received from the State. The object of this fund is to assist those students who are residents of Massachusetts and are dependent either wholly or in part on their own exertions, by furnishing them work in the several departments of the college. The greatest opportunity for such work is found in the agricultural, and the horticultural department.

Application for participation in the benefits of the labor fund should be made to the president of the college. Students desiring to avail themselves of its benefits must bring a certificate signed by one of the selectmen of the town in which they are resident, certifying to the fact that they require aid.

SELF-HELP

Good opportunities are afforded for self-support in part or in whole to those students who choose to avail themselves of them. But much depends upon the determination and the ability of the student applying for work. Some exceptional men have succeeded in paying their way through college. Not a few have paid a large share of their necessary expenses. Many have earned a small part of the cost of their college course. But in every case the student should have funds enough to pay his way until he can adapt himself to his new environment and show what he is capable of earning. The long summer vacation allows the student to earn good wages at home or elsewhere. There are no college exercises on Saturdays so that work for wages may then be performed. But no student should attempt to engage in work that will interfere with his success in his studies. The labor fund is employed in paying for the labor of students who require work, but the fund is limited and the college cannot promise employment to all applicants. Each case must be determined according to the circumstances of the time and the qualifications of the man.

RELIGIOUS SERVICES

Chapel services are held every week day at 8 A. M. and public worship in the chapel every Sunday at 9-15 A. M. Further opportunities for moral and religious culture are afforded by Bible classes taught by one of the professors and other teachers for an hour every Sunday afternoon, and by a religious meeting Thursday evening, under the auspices of the College Young Men's Christian Association.

SCHOLARSHIPS

ESTABLISHED BY PRIVATE INDIVIDUALS

Mary Robinson fund of one thousand dollars, the bequest of Miss Mary Robinson, of Medfield.

Whiting Street fund of one thousand dollars, the bequest of Whiting Street, Esq., of Northampton.

Henry Gassett fund of one thousand dollars, the bequest of Henry Gassett, Esq., of North Weymouth.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an Act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms of such application may be obtained from the president of the college.

DEGREES

No honorary degrees are conferred.

Those who complete the four years course will receive the degree of Bachelor of Science. The diploma is signed by the governor of the Commonwealth as well as by the president of the college.

Those who receive this degree may receive also the degree of Bachelor of Science from Boston University, for which a fee of ten dollars is charged; provided that the candidate in addition to the college course shall have mastered in a preparatory school a three year's preparatory course in studies beyond those commonly presented in the grammar schools of Massachusetts.

Those who complete the assigned courses will receive the degree of Master of Science for which a fee of ten dollars must be paid to the treasurer of the college.

Those who complete the three years' course of study required and present a satisfactory thesis will be given the degree of Doctor of Philosophy. The fee for this degree is twenty-five dollars.

Those to whom degrees are awarded must present themselves in person at commencement to receive them.

Prizes

The following prizes are offered annually for proficiency in the work of several of the departments of collegiate study:

AGRICULTURE

The Grinnell prizes, the first of twenty-five dollars, and the second of fifteen dollars, given by the late Hon. William Claflin, of Boston, in honor of the late George B. Grinnell, Esq., of New York, to those members of the senior class who produce the best and the second best examinations, oral and written, in theoretical and practical agriculture.

BOTANY

The Hills prizes, the first of twenty dollars, and the second of ten dollars, given by the late Henry F. Hills, of Amherst, to those members of the senior class who produce the best and the second best herbariums. Also a prize of five dollars, to that student of the senior class who produces the best collection of native woods.

ENGLISH

The Flint prizes, the first of thirty dollars, and the second of twenty dollars, given by Mr. Charles L. Flint, of Boston, of the class of 1881, to those members of the junior class, under certain restrictions, who produce the best and the second best orations. Both composition and delivery are considered in making the award.

The Burnham prizes, amounting in all to eighty dollars, given by the late T. O. H. P. Burnham, of Boston, to members

of the sophomore, and the freshman class, for excellence in composition work and in declamation. Composition work, in competition for these prizes is confined to the second semester of the sophomore year. Under certain restrictions, a first prize of twenty dollars, a second prize of ten, and a third prize of five are awarded. Declamation work, in competition for these prizes is confined to the second semester of freshman year. Under certain restrictions, a first prize of twenty-five dollars, and a second prize of twenty are awarded.

SPECIAL PRIZES

Special prizes are occasionally offered by various departments.

MILITARY DIPLOMAS

The commandant is authorized to give military diplomas, countersigned by the president of the college, to those men receiving the degree of Bachelor of Science who by their work in the military department during their course in college may have shown themselves worthy of distinction. These diplomas recommend those receiving them for commissions in the United States army or in the militia of the several states, vouching that they are fitted to fill the position of a commissioned officer.

WINTER COURSE PRIZES

The Dairy prizes, given by the Massachusetts Society for Promoting Agriculture, to members of the short winter course. Two sets of prizes are offered. The first set consists of three prizes of fifty, thirty, and twenty dollars, respectively, given for general excellence in all branches of the course as offered. The second set consists of three prizes of twenty-five, fifteen, and ten dollars, respectively, for excellence in the making of butter.

Award of Prizes

1901—1902

Grinnell Agricultural Prizes—Senior

First prize: Joshua Herbert Belden
Second prize: Edward Boyle Saunders

Hills Botanical Prizes—Senior

First prize: Arthur Lincoln Dacy
Second prize: John Martin Dellea

Flint Oratorical Prizes—Junior

First prize: Harry James Franklin
Second prize: Myron Howard West

Burnham Declamation Prizes—Sophomore and Freshman

First sophomore prize: George Edmund O'Hearn
Second sophomore prize: Arthur Lee Peck
First freshman prize: Herbert Harold Goodenough
Second freshman prize: George Howard Allen

Military Honors—Senior

The following cadets were reported to the Adjutant General U. S. Army, and to the Adjutant General of Massachusetts, as having shown special aptitude for military service:

Arthur Lincoln Dacy
Howard Lawton Knight
Edward Boyle Saunders

Massachusetts Dairy Prizes—Winter Course

First set (general excellence):
- First prize: George Weigold
- Second prize: James Edwin Stultz
- Third prize: Walter Aiken Conant

Second set (butter making):
First prize: Fred Porter Hall
Second prize: George Weigold
Third prize: Frederick Wade Richardson

Special Prize for Best Knowledge of Use of Fertilizer on Dairy Farm (given by W. H. Bowker)

George Weigold

Special Prize for Best Knowledge of Use of Fertilizer on Grass Land (given by B. von Herff)

Walter Edward Brigham

Degrees Conferred in 1902

DOCTOR OF PHILOSOPHY

Hinds, Warren Elmer	Townsend

BACHELOR OF SCIENCE

Belden, Joshua Herbert*†	Newington, Conn.
Bodfish, Henry Look *†	Tisbury
Carpenter, Thorne Martin*	Foxboro
Church, Frederick Richard*†	Ashfield
Claflin, Leander Chapin*†	Philadelphia, Pa.
Cook, Lyman Adams*†	Millis
Cooley, Orrin Fulton†	South Deerfield
Dacy, Arthur Lincoln*†	Boston
Dellea, John Martin*†	North Egremont
Dwyer, Chester Edwards*†	Lynn
Gates, Victor Adolph*†	Memphis, Tenn.
Hall, John Clifford*†	Sudbury
Hodgkiss, Harold Edward*†	Wilkinsonville
Kinney, Charles Milton†	Northampton
Knight, Howard Lawton*†	Gardner
Lewis, Claude Isaac*†	Unionville
Morse, Ransom Wesley*†	Belchertown
Paul, Herbert Amasa†	Lynn
Plumb, Frederic Henry*†	Bridgeport, Conn.
Saunders, Edward Boyle*†	Southwick
Smith, Samuel Leroy*†	South Hadley
West, David Nelson*†	Northampton

---

* Degree of Boston University
† Military Diploma

Graduate Students

For the Degrees of M. Sc., and Ph. D.

Ballou, Henry Arthur B.Sc. Massachusetts Agricultural College 1895	Amherst
Billings, George Austin B.Sc. Massachusetts Agricultural College 1895	South Deerfield
Haskins, Henri Darwin B.Sc. Massachusetts Agricultural College 1890	North Amherst
Hodgkiss, Harold Edward B.Sc. Massachusetts Agricultural College 1902	Wilkinsonville
Knight, Howard Lawton B.Sc. Massachusetts Agricultural College 1902	Gardner
Morrill, Austin Winfield B.Sc. Massachusetts Agricultural College 1900	Tewksbury
West, David Nelson B.Sc. Massachusetts Agricultural College 1902	Northampton

Total 7

Special Students

TWO YEARS' COURSE FOR WOMEN

Hunt, Justine	*Newton*	Dining Hall
Hyde, Edith Lucretia	*Baltimore, Md.*	——
Russell, Ida Josephine	*Amherst*	

Total 3

Under-Graduate Students

SENIOR CLASS

Allen, William Etherington	*Winthrop*	18 South College
Bacon, Stephen Carroll	*Leominster*	20 South College
Barrus, George Levi	*Goshen*	20 South College
Bowen, Howard Chandler	*Rutland*	11 South College
Brooks, Philip Whitney	*Cambridge*	12 South College
Cook, Joseph Gershom	*Clayton*	Mr. Thomson's
Franklin, Henry James	*Bernardston*	116 Pleasant St.
Halligan, Charles Parker	*Roslindale*	12 South College
Harvey, Lester Ford	*Woodbury, Conn.*	1 South College
Hood, William Lane	*Vandiver, Ala.*	Boarding Club
Jones, Gerald Denison	*South Framingham*	11 South College
Lamson, George Herbert, Jr.,	*East Hampton, Conn.*	1 South College
Monahan, Neil Francis	*South Framingham*	96 Pleasant St.
Nersessian, Paul Nerses	*Marash, Turkey*	Boarding Club
Osmun, Albert Vincent	*Brooklyn, N. Y.*	2 South College
Parsons, Albert	*North Amherst*	North Amherst
Peebles, William Warrington	*Washington, D. C.*	32 North College
Poole, Elmer Myron	*North Dartmouth*	5 South College
Proulx, Edward George	*Hatfield*	14 South College
Robertson, Richard Hendric	*Somerville,*	D. G. K. House
Snell, Edward Benaiah	*Lawrence,*	Mr. Thomson's
Tinkham, Charles Samuel	*Roxbury,*	D. G. K. House
Tottingham, William Edward	*Bernardston,*	10 North College
Tower, Winthrop Vose	*Melrose Highlands*	14 South College
West, Myron Howard	*Belchertown*	116 Pleasant St.

Total 25

JUNIOR CLASS

Ahearn, Michael Francis	*South Framingham*	Plant House
Back, Ernest Adna	*Florence*	Insectary
Blake, Maurice Adin	*Millis*	6 Phillips St.
Couden, Fayette Dickinson	*Amherst*	17 South College
Elwood, Clifford Franklin	*Green's Farms, Conn.*	96 Pleasant St.
Fahey, John Joseph	*Pittsfield*	Mr. Thomson's
Fulton, Edwin Stanley	*Lynn*	Hatch Expt. Station Chemical
Gay, Ralph Preston	*Stoughton*	21 North College
Gilbert, Arthur Witter	*West Brookfield*	28 North College
Gregg, John William	*Dorchester*	23 North College
Griffin, Clarence Herbert	*Winthrop*	18 South College
Haskell, Sidney Burritt	*Southbridge*	Professor Cooley's
Henshaw, Fred Forbes	*Templeton,*	25 North College
Hubert, Zachary Taylor	*Pride, Ga.*	31 North College
Lewis, Clarence Waterman	*Melrose Highlands*	Mr. Thomson's
Newton, Howard Douglas	*Stockbridge*	4 South College
O'Hearn, George Edmund	*Pittsfield*	Mr. Thomson's
Parker, Sumner Rufus	*Brimfield*	Hatch Expt. Sta'n Botanical
Peck, Arthur Lee	*Hartford, Conn.*	28 North College
Quigley, Raymond Augustine	*Brockton*	Mr. Thomson's
Raymouth, Reuben Raymond	*Goshen*	D. G. K. House
Staples, Walter Abbe	*Westboro*	22 North College
White, Howard Morgan	*Springfield*	9 South College

Total 23

SOPHOMORE CLASS

Adams, Richard Laban	*Jamaica Plain,*	101 Pleasant St
Allen, George Howard	*Somerville*	15 South College
Barnes, Hugh Lester	*Stockbridge*	4 South College
Bartlett, Francis Alonzo	*Belchertown*	116 Pleasant St.
Brett, Clarence Elmer	*Brockton*	Professor Brooks'
Carter, Chester Merriam	*Leominster*	6 North College
Craighead, William Hunlie	*Boston*	32 North College
Crosby, Harvey Davis	*Rutland*	Mr. Dickinson's
Cushman, Esther Cowles	*Northampton*	Northampton
Filer, Harry Burton	*Dwight*	27 North College
Gardner, John Joseph	*Milford*	Plant House
Goodenough, Herbert Harold	*Johannesburg, S. A.*	25 North College
Hall, Arthur William, Jr.	*North Amherst*	North Amherst
Hatch, Walter Bowerman	*Falmouth*	7 South College
Hill, Louis William	*Bridgeport, Conn.*	7 South College
Holcomb, Charles Sheldon	*Tariffville, Conn.*	66 Pleasant St.
Hunt, Thomas Francis	*Amherst*	Hatch Expt. Station Barn
Hutchings, Frank Farley	*South Amherst*	116 Pleasant St.
Ingham, Norman Day	*Granby*	22 North College
Kelton, James Richard	*Orange*	19 Phillips St.
Ladd, Edward Thorndyke	*Winchester*	6 South College
Lyman, John Franklin	*Amherst*	14 North College
Merrill, Charles Edward, Jr.	*Melrose*	24 North College
Munson, William Anson	*Aurora, Ill.*	15 South College
Newhall, Edwin White, Jr.	*San Francisco, Cal.*	84 Pleasant St.
Paige, George R.	*Amherst*	Veterinary Laboratory
Patch, George Willard	*Arlington Heights*	16 South College
Paul, Augustus Russell	*Framingham Center*	96 Pleasant St.
Pray, Try Civille	*Natick*	6 South College
Richardson, Justus Cutter	*Lowell*	86 Pleasant St.
Sanborn, Monica Lillian	*Salem*	96 Pleasant St.
Sears, William Marshall	*Brockton*	14 North College
Swain, Allen Newman	*New Dorchester*	116 Pleasant St.
Taylor, Albert Davis	*Westford*	86 Pleasant St.

Thompson, Harold Foss	*Roxbury Crossing*	Mr. Dickinson's
Tinkham, Henry Buffington	*South Swansea*	D. G. K. House
Tupper, Bertram	*West Newton*	Hatch Expt. Sta. Barn
Walker, Lewell Seth	*Natick*	23 North College
Walsh, Thomas Frederick	*Ayer*	
Whitaker, Chester Leland	*Somerville*	17 South College
Williams, Percy Frederick	*Natick*	D. G. K. House
Willis, Grenville Norcott	*Becket*	16 South College
Yeaw, Frederick Loring	*Winthrop*	Hatch Expt. Sta. Botanical

Total 43

FRESHMAN CLASS

Abbott, Chester Denning	*Andover*	12 East Pleasant St.
Bacon, Roland Aldrich	*Leominster*	D. G. K. House
Brydon, Robert Parker	*Lancaster*	26 North College
Carey, Daniel Henry	*Rockland*	7 North College
Carpenter, Charles Walter	*Monson*	5 McClellan St.
Chapman, George Henry	*New Britain, Conn.*	13 South College
Colton, William Wallace	*Pittsfield*	11 South College
Connelly, Thomas Henry	*Boston*	
Cowles, Edward Russell	*Deerfield*	101 Pleasant St.
Cutter, Frederick Augustus	*Pelham, N. H.*	96 Pleasant St.
Farrar, Allan Dana	*Amherst*	29 Northampton Road
Ferren, Frank Augustus	*Peabody*	56 Pleasant St.
Foster, Samuel Cutler	*Boston*	29 McClellan St.
French, George Talbot	*Tewksbury*	10 North College
Gaskell, Edwin Francis	*Hopedale*	5 North College
Goodal, Ray Coit	*Suffield, Conn.*	5 McClellan St.
Hartford, Archie Augustus	*Westford*	96 Pleasant St.
Hasting, Addison Tyler, Jr.	*Natick*	11 North College
Hayward, Afton Smith	*South Amherst*	101 Pleasant St.
Hersen, Albert Wood	*Westboro*	19 Phillips St.
Hood, Clarence Ellsworth	*Millis*	9 Phillips St.
Jones, Louis Franklin	*Somerville*	56 Pleasant St.
Keith, Earl Wadsworth		
Kennedy, Frank Henry	*South Boston*	8 South College
Mahoney, Francis Watson	*Boston*	8 South College
Markham, Joseph	*Ayer*	
Martin, James Edward	*Brockton*	29 McClellan St.
Morse, Stanley Fletcher	*Watertown*	9 South College
Moseley, Louis Hale	*Glastonbury, Conn.*	15 North College
Mudge, Everett Pike	*Swampscott*	12 North College
O'Neil, William James		
Peakes, Ralph Ware	*Newtonville*	11 South College
Prenn, Joseph	*Amherst*	7 North College
Racicot, Arthur Alphonsé, Jr.	*Lowell*	96 Pleasant St.
Rogers, Stanley Sawyer	*Boston*	19 Phillips St.
Russell, Harry Merwin	*Bridgeport, Conn.*	15 North College

Russell, Herbert Osborne	*North Hadley*	North Hadley
Scott, Edwin Hobart	*Cambridge*	McClellan St.
Shannon, Alonzo Henry	*Worcester*	31 North College
Sleeper, George Warren	*Swampscott*	86 Pleasant St.
Spurr, Fred Yerxa	*Melrose Highlands*	24 North College
Stevens, Fred Oramel	*Nashua, N. H.*	56 Pleasant St.
Strain, Benjamin	*Mt. Carmel, Conn.*	27 North College
Suhlke, Herman Augustus	*Leominster*	D. G. K. House
Sullivan, Patrick Francis	*Amherst*	19 Spaulding St.
Taft, William Otis	*East Pepperell*	13 South College
Tannatt, Willard Colburn	*Dorchester*	29 McClellan St.
Tirrell, Charles Almon	*Plainfield*	56 Pleasant St.
Watkins, Fred Alexander	*Hinsdale*	26 North College
Webb, Paul	*New Haven, Conn.*	66 Pleasant St.
Wellington, Richard	*Waltham*	8 North College
White, Vernon Olise	*Attleboro*	10 South College
Wholley, Michael Francis	*Cohassett*	56 Pleasant St.
Wood, Alexander Henry Moore	*Easton*	19 Phillips St.
Wood, Herbert Poland	*Hopedale*	5 North College

Total 55

Winter Course Class of 1903

Bailey, Norman F.	*Pittsfield*
Blessing, John M.	*Albany, N. Y.*
Carlsson, Axel Robert	*Cambridge*
Clark, Albert Philip	*Pittsfield*
Colburn, Ned Springer	*Haverhill*
Cooke, Ernest Hubbard	*Austerlitz, N. Y.*
Dorling, Samuel William	*Spencer*
Dwight, Daniel Hunt Miller	*Brewster*
Eaton, Harvey Dana	*North Reading*
Folsom, Mrs. Sara Elizabeth	*Revere*
Gage, William Allen	*Crown Point, N. Y.*
Gerber, Nelson	*Webster*
Gilbert, Solon Mowey	*Auburn*
Goold, James	*Albany, N. Y.*
Kilbon, Marshall Edwards	*Oberlin, Ohio*
King, George William	*Dudley*
Kohles, Herman	*Fitchburg*
MacDonald, Raymond Lewis	*Brookline*
Macomber, Walter White	*Sturbridge*
Mebane, Albert	*Greensboro, N. C.*
Miller, Fred	*East Walpole*
Mower, John Laidlaw	*Litchfield, Conn.*
Ramsdell, Elmer Pitts	*West Newton*
Rogers, Harry Fred	*Westboro*
Scott, Richard	*Shrewsbury*
Sonoda, Takeshi Kagashima	*Japan*
Stygles, Clarence Herman	*Hyde Park, Vt.*
Williamson, Oran Ethan	*Altamont, N. Y.*

Total 28

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Total		184

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CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

1903-1904

CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

1903-1904

AMHERST
PUBLISHED BY THE COLLEGE
1903

Press of Carpenter & Morehouse,
Amherst, Mass.

Calendar for 1903-1905

1903			
September	17	Thursday	First semester began at 8 A. M.
November	26	Thursday	Thanksgiving Day
December	23	Wednesday	Holiday recess begins
1904			
January	6	Wednesday	8 A. M. Holiday recess ends
February	3	Wednesday	First semester ends
February	4	Thursday	8 A. M. Second semester begins
March	30	Wednesday	Spring recess begins
April	5	Tuesday	8 A. M. Spring recess ends
June	11	Saturday	Grinnell prize examination of senior class in Agriculture
June	12	Sunday	Baccalaureate sermon
June	13	Monday	Flint prize oratorical contest Burnham prize speaking
June	14	Tuesday	Meeting of the alumni Class day exercises, battalion drill, reception by the president and the trustees
June	15	Wednesday	Commencement exercises
June	16, 17	Thursday and Friday	8-30 A. M. Examinations for admission at Botanic Museum, Amherst; Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; Pittsfield; Horticultural Hall, Worcester

Vacation of Thirteen Weeks

September	13, 14	Tuesday and Wednesday	8-30 A. M. Examinations for admission, Botanic Museum
September	15	Thursday	8 A. M. First semester begins
November	24	Thursday	Thanksgiving Day
December	21	Wednesday	Holiday recess begins
1905			
January	4	Wednesday	8 A. M. Holiday recess ends
February	1	Wednesday	First semester ends
February	2	Thursday	8 A. M. Second semester begins

Origin, Object, and Location

The Massachusetts Agricultural College was among the first of the institutions to be established under the provisions of the National Land-Grant Act of 1862. This Act donated "public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." The framer of this bill was the late Senator Justin Smith Morrill of Vermont. At the present time over sixty institutions of higher learning in this country directly owe their origin or their prosperity to the benefits of this great educational measure.

The college was incorporated in 1864 by an Act of the State Legislature; and on the second of October, 1867, was formally opened to an entering class of thirty-three.

In January, 1875, an arrangement was made with the authorities of Boston University, whereby the college, without losing its independence, should thereafter become the "School of Agriculture" of the university. By means of this arrangement, students of the Massachusetts Agricultural College, besides obtaining the regular diploma of the college, which is accepted by American universities and by the University of Göttingen, in Germany, may, upon payment of a fee, and under certain conditions, receive the diploma in science awarded to graduates of the Boston institution. In 1882 the State Experiment Station was located on the college grounds. The station has since become connected with the college.

The college offers a free education to any American student who may be of good character and who may fulfil the requirements for admission. Women are admitted to the courses of the institution with a few exceptions on the same conditions as men. It also offers its courses of study to foreign students upon payment by them of a tuition fee. It gives a four years' course leading to the degree of Bachelor of Science, and graduate courses leading to the degrees of Master of Science and of Doctor of Philosophy. It also offers winter courses of ten weeks, and a special course of two weeks in bee culture.

The college is situated in the beautiful town of Amherst. The grounds are especially attractive, and comprise over 400 acres of land, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent.

Amherst is ninety-seven miles west of Boston. It is on the line of the Southern Division (Central Massachusetts Railroad) of the Boston and Maine Railroad, as well as on that of the Central Vermont Railroad. It is easily accessible.

The Corporation

	Term expires
HENRY S. HYDE, Springfield	1904
MERRITT I. WHEELER, Great Barrington	1904
WILLIAM R. SESSIONS, Springfield	1905
CHARLES L. FLINT, Brookline	1905
WILLIAM H. BOWKER, Boston	1906
GEORGE H. ELLIS, Boston	1906
J. HOWE DEMOND, Northampton	1907
ELMER D. HOWE, Marlborough	1907
NATHANIEL I. BOWDITCH, Framingham	1908
WILLIAM WHEELER, Concord	1908
ELIJAH W. WOOD, West Newton	1909
CHARLES A. GLEASON, New Braintree	1909
JAMES DRAPER, Worcester	1910
SAMUEL C. DAMON, Lancaster	1910

MEMBERS EX OFFICIO

HIS EXCELLENCY JOHN L. BATES

Governor of the Commonwealth

HENRY H. GOODELL

President of the College

——— ——— ———

Secretary of the Board of Education

J. LEWIS ELLSWORTH

Secretary of the Board of Agriculture

OFFICERS OF THE CORPORATION

His Excellency Governor JOHN L. BATES . . . Boston
President

WILLIAM R. SESSIONS . . . . Springfield
Vice-President

J. LEWIS ELLSWORTH . . . . Boston
Secretary

GEORGE F. MILLS . . . . . Amherst
Treasurer

CHARLES A. GLEASON. . . . . New Braintree
Auditor

Board of Overseers

STATE BOARD OF AGRICULTURE

EXAMINING COMMITTEE OF OVERSEERS

John Bursley (Chairman)	West Barnstable
Charles K. Brewster	Worthington
Warren C. Jewett	Worcester
Arthur A. Smith	Colrain
Charles H. Shaylor	Lee

Faculty

HENRY H. GOODELL, LL.D.
President of the College

LEVI STOCKBRIDGE
Professor of Agriculture, Honorary

CHARLES A. GOESSMANN, PH.D., LL.D.
Professor of Chemistry

CHARLES WELLINGTON, A.M., PH.D.
Associate Professor of Chemistry

CHARLES H. FERNALD, A.M., PH.D.
Professor of Zoölogy

REV. CHARLES S. WALKER, A.M., PH.D.
Professor of Political Science, Chaplain, and Secretary of the Faculty

WILLIAM P. BROOKS, PH.D.
Professor of Agriculture

GEORGE F. MILLS, A.M.
Professor of English and Latin

JAMES B. PAIGE, D.V.S.
Professor of Veterinary Science

GEORGE E. STONE, PH.D.
Professor of Botany

JOHN E. OSTRANDER, A.M., C.E.
Professor of Mathematics and Civil Engineering

HENRY T. FERNALD, M.SC., PH.D.
Professor of Entomology

JOHN ANDERSON, CAPTAIN, U.S.A.
Professor of Military Science and Tactics

FRANK A. WAUGH, M.SC.
Professor of Horticulture

RICHARD S. LULL, M.SC., PH.D.
Associate Professor of Zoölogy, and Curator of the Zoölogical Museum

PHILIP B. HASBROUCK, B.SC.
Associate Professor of Mathematics and Adjunct Professor of Physics

*HERMAN BABSON, A.M.
Assistant Professor of English

FRED S. COOLEY, B.SC.
Assistant Professor of Agriculture

S. FRANCIS HOWARD, M.SC.
Assistant Professor of Chemistry

ROBERT W. LYMAN, LL.B.
Lecturer on Farm Law

LOUIS R. HERRICK, B.SC.
Instructor in Modern Languages

HOWARD L. KNIGHT, B.SC.
Instructor in English

GEORGE F. FREEMAN, B.SC.
Instructor in Botany

GEORGE O. GREENE, M.SC.
Instructor in Horticulture

FRANCIS CANNING
Instructor in Floriculture

——— ——— ———
Instructor in Chemistry

E. FRANCES HALL
Librarian

**Absent on leave*

RICHARD S. LULL, M.SC., PH.D.
Registrar
ELISHA A. JONES, B.SC.
Superintendent of Farm
NEWTON WALLACE
Electrician
P. E. NAYLOR
Steward of Dining Hall

Committees of the Faculty

Instruction: Professors MILLS, OSTRANDER, WELLINGTON, HASBROUCK, the REGISTRAR
Electives: Professors C. H. FERNALD, BROOKS, PAIGE, HASBROUCK and BABSON
Athletics: Professors PAIGE, BROOKS, ANDERSON and HOWARD
Catalogue: Professors WALKER and OSTRANDER, Mr. HERRICK, and the REGISTRAR
Entrance Examinations: Professors HASBROUCK, LULL and BABSON
Rules: Professors WALKER, LULL and HOWARD
Graduate Courses: Professors C. H. FERNALD, WELLINGTON, STONE and H. T. FERNALD
Schedule: Professors OSTRANDER and HASBROUCK
Dining Hall: Professors MILLS and HASBROUCK
Chairman of the meetings of the instructors of the several classes
Senior class: Professor MILLS
Junior class: Professor WELLINGTON
Sophomore class: Mr. HERRICK
Freshman class: Professor HASBROUCK

Admission

Every candidate for admission must be at least sixteen years of age, and must present a testimonial of good character from the principal of the last school that he attended.

FOUR-YEARS' COURSE

Candidates for admission to the freshman class will be received on certificate, as explained below, or on examination in the following subjects:

Algebra, through quadratics. Plane geometry. English. General history, Myers' *General History*. Civil government, Mowry's *Studies in Civil Government*. Physiology, Martin's *The Human Body*, briefer course. Physical geography.

This examination may be oral or written; the standard required for passing is 65 per cent. in each subject. Knowledge of the principles of arithmetic is presupposed, although an examination in this subject is not required. Inasmuch as it is found that candidates are frequently deficient in algebra and geometry, they are urged to obtain such drill in these subjects as shall secure accuracy and readiness in the application of principles to practical examples; furthermore no student found unsatisfactory in both of these subjects will be admitted to the college.

A candidate will not be accepted in English whose work is notably deficient in point of spelling, punctuation, phraseology, or division into paragraphs. The candidate will be required to present evidence of a general knowledge of the subject-matter of books named below, and to answer questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to test the candidate's power of clear and accurate expression, and will imply only a general knowledge of the substance of the books. The books set for examination in 1904 and 1905 are: Shakespeare's *The Merchant of Venice;* Goldsmith's *The Vicar of Wakefield;* Scott's *Ivanhoe;* Tennyson's *The Princess;* Lowell's *The Vision of Sir Launfal;* George Eliot's *Silas Marner.*

TIME, PLACES, AND ORDER OF EXAMINATIONS

The regular examinations for admission in 1904 will be held in the Botanic Museum of the Agricultural College, in Amherst, on Thursday and Friday, June 16 and 17, and on Tuesday and Wednesday, September 13 and 14, as follows:

First day:	8-30 A. M.	Registration
	9-00 A. M.	English
	11-00 A. M.	General history
	2-00 P. M.	Geometry
Second day:	9-00 A. M.	Civil government
	10-00 A. M.	Algebra
	2-00 P. M.	Physiology
	3-00 P. M.	Physical geography

Entrance examinations in June will be held on the same days and in the same order as in Amherst, at Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; at Horticultural Hall, Worcester, and at Pittsfield. Candidates may be examined and admitted at any other time in the year.

Preliminary examinations in one or more of the required subjects may be taken a year before the candidate expects to enter college, and credit for successful examination in any subject will stand for two years after the examination.

ADMISSION ON CERTIFICATE

Certificates of schools and academies approved by the faculty of the college are accepted in place of examinations. These certificates must be made out on blanks furnished by the registrar to the principal on application, and must be signed by the principal of the school making such application. Students entering on certificate may offer physics or chemistry in place of physiology or physical geography.

A student admitted on certificate may be dropped from college at any time during freshman year, when his work is not satisfactory; and the privilege implied in the acceptance of a certificate may be revoked whenever, in the judgment of the faculty, the student, either through lack of ability or of application, fails to attain the standard required.

ADMISSION TO ADVANCED STANDING

Candidates for classes more advanced than the freshman class will be examined in the studies which have been pursued by the class to which they desire admission.

Courses of Instruction

FOR THE DEGREE OF BACHELOR OF SCIENCE

AGRICULTURE

Introductory. Relations of federal and state governments to agriculture, four lectures. History of agriculture, tenure of land, rents, holdings, etc., six lectures.

Freshman year, first semester, three hours a week, required; Animal breeding. Shaw's *Breeding Animals*, lectures and discussion of principles of breeding. Assistant Professor Cooley

Sophomore year, seven weeks, first semester, four exercises a week in class room, required; breeds of farm live stock; sheep, cattle. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.* Assistant Professor Cooley

Sophomore year, nine weeks, first semester, four exercises a week in class room, required; horses and swine. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.* Assistant Professor Cooley

Sophomore year, eight weeks, second semester, three hours a week, required; dairying. Lectures on dairy farming, milk production, handling and marketing of milk, milk preservation and modification, and products of milk. Text-book, Wing's *Milk and Its Products.* Assistant Professor Cooley

Sophomore year, ten weeks, second semester, required; soils: formation, classification, composition; physical and chemical characteristics, and their relations to maintenance and increase in productiveness. Brooks' *Agriculture*, Vol. I, supplemented by lectures and laboratory work. Professor Brooks

Junior year, ten weeks, first semester, elective; methods of soil improvement, including tillage, drainage, and irrigation. Brooks' *Agriculture*, Vol. I, supplemented by lectures, laboratory work, and practical exercises. Professor BROOKS

Junior year, four weeks, first semester, elective; manures: production, composition, properties, adaptation and use. Brooks's *Agriculture*, Vol. II, supplemented by lectures and practical exercises. Professor BROOKS

Junior year, four weeks, first semester, elective; stock judging. Assistant Professor COOLEY

Junior year, second semester, elective; fertilizers, including a critical study of their production, composition, properties, adaptation and use; and green manuring. Brooks' *Agriculture*, Vol. II, supplemented by lectures, laboratory work and practical exercises. Professor BROOKS

Senior year, four weeks, first semester, four hours a week, elective: silos and ensilage: historical development; the merits and methods of construction of the different kinds of silos; the crops suited for ensilage; ensilage machinery: the methods of filling the silo; and the nature and extent of the changes taking place in ensilage as affecting food value. Lectures, books of reference, and practical exercises.

Professor BROOKS

Senior year, seven weeks, first semester, four hours a week, elective; feeding animals: principles of digestion and animal nutrition, a study of feeding stuffs (coarse and concentrated). The relation of food to product; compounding rations. Armsby's *Cattle Feeding*, lectures and discussion.

Assistant Professor COOLEY

Senior year, seven weeks, first semester, four hours a week, elective; dairying: selection and management of the dairy farm, dairy cattle, chemical and physical properties of milk, etc., cream, butter, cheese, and by-products.

Assistant Professor COOLEY

Senior year, first and second semester, two exercises a week, for ten weeks; dairy practice; use of separators, Babcock tester, butter making, etc. SPECIALISTS

Senior year, second semester, elective; the crops of the farm and crop rotation: including a study of the origin and agricultural botany of all the leading crops of the farm; annual forage crops, grasses and legumes, cereals, root-crops, vegetables, tobacco, and other special commercial crops. The production and use of each; the varieties and methods of improvement; the adaptation to soil; the special manurial requirements; and the methods of raising and harvesting are considered. Lectures, reference books, and field work.

Professor BROOKS

Senior year, second semester, elective; agricultural experimentation: objects, methods, sources of error; interpretation of results. Lectures and study of reports, bulletins, etc.

Professor BROOKS

Senior year, second semester, elective; farm management: selection of the farm, its subdivisions and equipment, buildings, fences, roads, water supply; farm capital, permanent, perishable, and floating. The labor of the farm and its management; farm power and farm machinery. Lectures and practical exercises. Professor BROOKS

Seminar courses, by arrangement, for advanced students.

Special problems requiring experiment or other research investigation will be assigned to students fitted for and desiring such work.

Training and practice in the use of farm implements and machines by arrangement when desired.

HORTICULTURE

This department endeavors to give the student a working knowledge of horticulture on its practical and on its scientific side. The attempt is made to inculcate a taste and an enthusiasm for horticultural pursuits, in place of distaste and dislike for the drudgery of farm life. On these things success and further progress chiefly depend.

The courses now offered are as follows, though others will be added as occasion requires:

1. *Sophomore class*, second semester. The fundamental operations of horticulture—propagation, pruning and cultivation—as related to the physiology of the plant. During the first half of this course Bailey's Nursery Book is used as a text.
Mr. Greene

2. *Junior year*, first semester. Pomology. This course covers the three natural divisions of the subject, viz.: (a) systematic pomology, or the study of the fruits themselves, (b) practical pomology, or the practice of fruit growing, (c), commercial pomology, or the principles underlying the marketing of fruits. The course is pursued by means of text-book, lectures, laboratory and field exercises. Mr. Greene

3. *Junior year*, first semester, four periods weekly. Plant breeding. Based on a thorough examination of the laws of heredity and of variation and of the principal theories of evolution. Lectures, accompanied by practice and direct experiments in crossing and hybridizing plants. Professor Waugh

4. *Junior year*, second semester, four periods weekly. Market gardening, including vegetables and small fruits. Locations, soils, methods of cultivation and marketing. Text-book Bailey's *Principles of Vegetable Gardening*, lectures and field exercises. Mr. Greene

5. Individual problems will be assigned to seniors who elect horticulture. This gives the student an opportunity for specialization in various lines of fruit growing, vegetable culture, greenhouse management, landscape gardening, etc.

Professor WAUGH, Mr. GREENE and Mr. CANNING

A seminar, made up of all students electing advanced work in horticulture or landscape gardening, meets at regular intervals for the discussion of any matters pertaining to the subject. Successful and noted horticulturists from outside the college are frequently present at these meetings to speak on the topics with which they are especially identified.

LANDSCAPE GARDENING

The college wishes to promote the work in landscape gardening in every way possible. The aim of the courses is to give the general student an understanding of the fundamental principles of design and of good taste as applied to gardening; and to prepare advanced students for the practice of landscape gardening in its various branches.

Although a variety of other work along related lines is available, the courses now definitely offered are as follows:

1. *Junior year*, four periods weekly. Materials. This course is designed to give the student an intimate acquaintance with the trees, shrubs and other plants used in landscape gardening. Professor WAUGH and Mr. CANNING

2. *Junior year*, second semester, four hours a week. Elements of landscape design. The fundamental principles underlying the artistic development of parks, estates, gardens and other areas, together with some of the simpler applications to practical conditions. During the first half of the term Waugh's *Landscape Gardening* will be used as a text.

Professor WAUGH

3. *Senior year*, first and second semesters, four laboratory periods weekly. Advanced landscape gardening. Lectures, conferences, field exercises, and extensive practice work with criticism. The student is given definite problems to solve, these problems being arranged in such an order as to develop the subject logically in the student's mind.

Professor Waugh and Mr. Canning

CHEMISTRY

This course aims to inculcate accurate observation, logical thinking, systematic and constant industry, together with a comprehensive knowledge of the subject. Instruction is given by text-book, lectures, and a large amount of laboratory work under adequate supervision. The laboratory work at first consists of a study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by a quantitative analysis of salts, minerals, soils, fertilizers, animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest, such as the production of sugar, starch, and dairy products; the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders and foods; and the analysis of soils, waters, milk, wine, and other animal and vegetable products.

The courses are as follows:

Freshman year, second half of second semester, four hours a week; general chemistry, part 1, principles of chemistry, non-metals. Newth's *Inorganic Chemistry*.

Assistant Professor Howard

Sophomore year, first semester, six hours a week; general chemistry, part 2, metals. Assistant Professor Howard

Second semester, five hours a week ; subject continued, dry analysis. Assistant Professor HOWARD

Junior year, first semester, eight hours a week ; qualitative and quantitative analysis, organic chemistry. Four hours a week ; special subject. Professor WELLINGTON

Second semester, ten hours a week ; organic chemistry. Remsen's *Organic Chemistry*. Five hours a week ; special subject. Professor WELLINGTON

Senior year, (elective), first semester, three hours a week ; chemical industries. Professor GOESSMANN

Eight hours per week ; quantitative analysis and physical chemistry, Reychler-McCrae's *Physical Chemistry*.
Professor WELLINGTON and Assistant Professor HOWARD

Second semester, eight hours a week ; advanced work with lectures. Professor WELLINGTON

GEOLOGY

1. Mineralogy, *Junior year*, first semester, seven weeks, three hours a week. A course of systematic determinative mineralogy based on Brush's *Manual*. This work is carried on in the laboratory and consists in determining the minerals by a study of lustre, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests.
Assistant Professor HOWARD

2. Geology, *Junior year*, second semester, eleven weeks, three hours a week. Dynamical, structural, and historical geology based upon recitations assigned from Scott's *Introduction to Geology*. Topics in economic geology are also assigned, mainly from Tarr's *Economic Geology*, to each member of the class in turn, upon which the student is expected to report. Ample opportunity for illustration is afforded by the museum collection and excursions in the Connecticut valley. Professor LULL

ZOÖLOGY

1. Anatomy and Physiology.—*Freshman year*, one-half of the second semester, four hours a week. Martin's *The Human Body* (advanced course) is used as a text-book, from which recitations are assigned, supplemented by lectures and demonstrations, illustrated by means of anatomical models and charts.
Professor LULL.

2. Zoölogy, *Sophomore year*, first semester, one lecture and recitation and one laboratory period each week. This course aims to give a brief general survey of the animal kingdom and consists of a series of laboratory studies of a number of different types illustrative of the principal groups, supplemented by a lecture course amply illustrated by the very complete museum collection. Recitations, both oral and written, are assigned upon the knowledge gained in the laboratory, from the lectures, and from Parker and Haswell's *Manual of Zoölogy*.
Professor LULL.

3. Zoölogy, *Junior year* (elective for students in the biological course) first semester, four exercises of two hours each, second semester three exercises of two hours each. A course in systematic zoölogy based upon Parker and Haswell's Text-Book of Zoölogy. The laboratory course embraces the morphology of an ample series of forms representative of the different types of animals, considerable attention being paid to anatomical and histological methods as well as to the knowledge gained thereby. Lectures and recitations are of the nature of informal discussions. Professor LULL

POLITICAL SCIENCE

The purpose of the entire course is to fit the student to understand the economical and political movements of his time, so that he may successfully solve the problems confronting him.

Economics, *Junior year*, second semester, four hours a week. 1. The elements of political economy are taught by means of text-book (this year F. A. Walker's *Political Economy, Briefer Course*) and lectures, the aim being to make the student familiar with the generally accepted facts, definitions, principles and laws of the science; and to train him to criticize theories, scrutinize facts, and weigh arguments. 2. The industrial history of England and of the United States is studied. Gibbins' *Industrial History of England* is used. 3. The following elective courses are offered: economics of agriculture; banks and banking; problems of the currency; trusts or monopolistic corporations; transportation; socialism. 4. Practical economics. Each member of the class selects for investigation a question, in which he is interested, and devotes two or three months to its solution.

Papers giving the results of research, prepared by members of the class, are read, and discussed by the students. Each student is asked to explain and defend from criticism the statements and the conclusions made in the paper he presents. The department has at its disposal a working library and a collection of material for the use of students.

Professor WALKER

Constitution of the United States, *Senior year*, four hours a week during half of the first semester and the whole of the second semester. 1. Political institutions. By use of text-book (Woodrow Wilson's *The State*) and lectures, the student is led to understand what is the government, municipal, state, and federal, now existing in the United States. This government is compared and contrasted with the governments of England, France and Germany. Care is taken to familiarize the student with the practical methods of legislation, of nominating conventions, of elections, and of administration. 2.

Constitutional history of England and of the United States, with discussions relating to the origin, nature, scope, and purpose of government. Professor WALKER

Lectures on law, second semester, one hour a week. This course treats of laws relating to business, especially to business connected with rural affairs, citizenship, domestic relations, farming contracts, riparian rights, real estate, and common forms of conveyance. Practical work is required such as may fit one to perform the duties of a justice of the peace.

Mr. LYMAN

ENGLISH

This department aims to secure : (a) ability to give written and oral expression of thought in correct, effective English ; (b) acquaintance with the masterpieces of American and English literature ; (c) ability to present, logically and forcibly, oral and written arguments on propositions assigned for debate.

The following courses are offered : under (a) rhetoric and oratory ; under (b) American literature and English literature ; under (c) argumentation. The elective course in senior year is in language and literature.

1. Rhetoric. This course extends through the two semesters of freshman year, and through the second semester of sophomore year. In the first semester of freshman year, work is confined to essay writing and to personal criticism, by the instructor, of the students' compositions. This criticism is offered at stated intervals to each student individually, according to a posted schedule of appointments. At the beginning of the semester necessary information with regard to the preparation of essays is furnished each student. In the second semester of freshman year, the study of literary types is undertaken in the form of class-room work in prose composition,

including exposition, persuasion, narration, description, and in prose diction, including usage and style. Special attention is given to the training of the inventive ability of the student. The text-book used is Baldwin's *College Manual of Rhetoric.* In the second semester of sophomore year, individual work in essay writing is again taken up, largely based upon the previous work of the class in American literature. (See 3 below.) Here also personal criticism is offered. Mr. Knight

2. Oratory. Individual drill in declamation, first in private and then before the class, is given during the second semester of freshman year. The choice of speakers for the Burnham prizes is based upon this work. In the junior year, during the first semester, at least two orations, upon subjects assigned or chosen, are written, and delivered before the class. Every oration is criticised by the instructor before it is committed to memory by the student. The choice of speakers for the Flint prizes in oratory is based upon this work. Mr. Knight

3. Literature. American literature is studied in the first semester of sophomore year, four hours a week. The course comprises, first, the careful study of a text-book, (Newcomer's *American Literature,*) together with recitations based upon the same; secondly, the taking of notes from lectures, dwelling upon topics not fully treated in the text-book; and thirdly, the reading outside of the class-room of assigned selections from the prose and poetical works of standard American authors.

Mr. Knight

The history of English Literature is studied during the second semester of sophomore year, four hours a week. The work is based upon a text-book, this year Johnson's *History of English and American Literature.* The topical method is followed in recitation, and instead of formal lectures, there are discussions of points requiring a fuller development than the text-book gives. Collateral readings of literature are required. Frequent written tests are given in which particular attention is given to (a) the definition of words used in the text-book ; (b) the use of English in the development of the topics unfolded in the text-book or discussed in the class-room.

Professor MILLS

4. Argumentation. Four hours a week during the first semester of junior year are given to written and oral argumentation. The course is outlined as follows : (a) principles of argumentation as laid down in a text-book or by lecture ; (b) briefs and brief-making ; (c) briefs developed into forensics and submitted for personal criticism ; (d) debates.

Professor MILLS

Senior elective course, two semesters, four hours a week. The work in this course is upon the following subjects : (a) English language, its origin, history, and development, with particular attention to the study of words as outlined in Anderson's *A Study of English Words* ; (b) English literature, principally of the eighteenth and nineteenth centuries.

Professor MILLS

VETERINARY SCIENCE

The course of instruction in veterinary science has been arranged to meet the demands of the students, who, after graduation, purpose following some line of work in practical agriculture. Particular stress is laid upon matters relating to the prevention of disease in animals. In addition, the interests of prospective students of human and comparative medicine have been taken into account in the arrangement of the course of study. The subject is taught by lectures, laboratory exercises, demonstration, and clinics.

Senior year, (elective), first semester, four hours a week ;

veterinary hygiene, comparative (veterinary) anatomy, general pathology. Professor PAIGE

Second semester, four hours a week; veterinary materia medica and therapeutics; theory and practice of veterinary medicine; general, special, and operative surgery; veterinary bacteriology and parasitology; medical and surgical clinics. Professor PAIGE

The instruction in bacteriology is given by means of lectures, recitations, and laboratory exercises. The object of this course of study is to acquaint the student with the various organisms found in air, water, soil, milk, and the body, and their relation to such processes as decomposition, fermentation, digestion, and production of disease. The toxic substances resulting from the growth of organisms are considered, as well as the antitoxines used to counteract their action.

Senior year, half of the first semester, four laboratory exercises of two hours each a week. Required. Professor PAIGE

BOTANY

The object of the course in Botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. The undergraduate work extends through six semesters. The first two semesters are required. An outline of the course follows:

Freshman year, first semester, five hours a week; laboratory work and lectures. Histology and physiology of the higher plants. This includes a study of the minute structure of the plant organism, such as stems, roots, leaves, seeds, etc., together with their function and chemical and physical properties. This course extends into the next semester.

Mr. FREEMAN

Freshman year, second semester, three hours a week. Laboratory work, lectures, and text-book. Outlines of classification and morphology of the higher plants. This course follows the preceding one, and commences about the first of March. It is devoted to a study of the relationship of plants, their gross structure, together with extensive individual practice in flower analysis. An herbarium of 200 species of plants is required.
Mr. FREEMAN

Junior year, first semester, five hours a week, two laboratory exercises and one lecture period a week. Cryptogamic botany. This includes a study of the lower forms of plant life necessary for a comprehension of the following courses. Mr. FREEMAN

Junior year, second semester, five hours a week, two laboratory exercises and one lecture period a week. Elements of vegetable pathology and physiology. This course includes a study of the common fungus diseases of crops, and consideration of the method of prevention and control of the same. The plant's function as related to susceptibility to disease is also taken up. All of the junior botany is included in four of the junior elective courses. Professor STONE

Senior year, (elective), both semesters, three laboratory exercises and one lecture period a week. (a) Plant physiology. (b) Plant pathology. Either course is optional. This course is adapted to students who desire a more detailed knowledge of plant diseases and plant physiology. Extensive use is made of the valuable and constantly increasing experiment station literature. Professor STONE

MATHEMATICS, PHYSICS, AND ENGINEERING

This department has charge of the instruction in mathematics, physics, civil engineering, and drawing. The aim is to secure thorough work in the fundamental principles and train the mind in clear and logical thinking. The application of the subjects to practical problems is given special attention. The work of the department extends over the four years as outlined below.

MATHEMATICS

Freshman year, first semester, five hours a week; higher algebra, including ratio and proportion, progressive binomial theorem, series undetermined coefficients, logarithms, continued fractions, permutations. Wells' *College Algebra*.
Professor HASBROUCK

Second semester, two hours a week; solid geometry. Wells' *Solid Geometry*. Professor HASBROUCK

Plane trigonometry, two hours a week. Phillips and Strong's *Elements of Trigonometry*. Professor HASBROUCK

Junior year, for mathematical and chemical students, first semester, four hours a week; analytic geometry of the line, circle, conic sections and higher plane curves. Wentworth or Bowser's *Analytic Geometry*. Professor OSTRANDER

Second semester, four hours a week; differential and integral calculus. Osborne's *Calculus*. Professor OSTRANDER

PHYSICS

Sophomore year, first semester, four hours a week; elementary mechanics of solids, liquids and gases, heat, and sound. Dana's *Elementary Mechanics*, Carhart's *University Physics*.
Professor HASBROUCK

Second semester, four hours a week; electricity, magnetism, and light. Carhart's *University Physics*.
Professor HASBROUCK

Senior year, elective for those students who have taken junior mathematics; first semester, four hours a week; analytic mechanics. Peck's *Analytic Mechanics*.

Professor HASBROUCK

Second semester, four hours a week; laboratory work.

Professor HASBROUCK

CIVIL ENGINEERING AND SURVEYING

Sophomore year, second semester, two exercises of two hours a week. Plain surveying with field work, including the use of the usual surveying instruments. *Surveying Manual*, Pence and Ketchum.

Professor OSTRANDER

Instruction in Civil Engineering will be given in two distinct courses of one year each, the courses alternating. They will be open to students of the junior and senior classes as indicated below. The course for 1904-5 will be for students in mathematics only. First semester, three hours recitation and two hours draughting a week; stresses in roofs, bridges and graphic statics. Merriman and Jacoby's *Roofs and Bridges*, Parts I and II.

Second semester, four hours a week; hydraulics and sanitary engineering. Merriman's *Hydraulics and lectures*.

Professor OSTRANDER

The course of 1905-6 will be required of juniors and seniors taking the courses in mathematics and landscape gardening.

First semester, four hours a week; strength of materials, foundations and masonry construction. Text-book and lectures.

Professor OSTRANDER

Second semester, three hours recitation or lectures and two hours field work or draughting a week; topographic and higher surveying, highway construction and the measurement of earth work pavements and railroad construction. Text-book and lectures.

Professor OSTRANDER

DRAWING

Junior year, first semester, two two-hour sessions a week for students in mathematics, and landscape gardening; free hand drawing.

Second semester, two two-hour sessions a week, mechanical and topographic drawing.

ENTOMOLOGY

The importance of a knowledge of insects in every department of life is recognized by placing an introductory course in this subject as a required study in the junior elective courses—(1) agriculture, (2) horticulture, (3) biology, (4) landscape gardening. For those who desire a further knowledge of it, because of its importance to their future occupations, a senior elective is offered, so shaped as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry, or science teaching, as life occupations.

Junior year, second semester, four exercises a week, of two hours each; lectures, laboratory, and field work: general consideration of insect structure and life histories; systematic study of the groups of insects with particular reference to those of economic importance; methods for preventing or checking their ravages; insecticides and apparatus for their use; the collecting, mounting, and naming of insects, and examination of the work of insects in the field and laboratory.

Professor H. T. Fernald

Senior year, (elective), first and second semesters, four laboratory exercises of two hours each a week; lectures, laboratory and field work: advanced morphology of insects; economic entomology; training in the determination of insects; use of literature on entomology; study of life histories; value and application of insecticides: thesis on insects most closely related to future occupation of the student.

Professors C. H. Fernald and H. T. Fernald

MODERN LANGUAGES

French.—Course I. Requires for the two semesters of the freshman year, four hours a week, first semester; four hours a week, second semester. The aim of this course is to enable the student to read modern French fluently, especially that found in scientific journals and treatises. The first ten weeks are devoted to gaining a thorough mastery of the accent and such principles of grammar and syntax as are covered by the first half of Whitney's *French Grammar*. Great stress is laid upon the acquisition of a correct accent, a good vocabulary and a thorough comprehension of the main idiomatic difficulties of the language. This course is further strengthened by constant drill in pronunciation, exercises, and composition.

Mr. Herrick

Course II. Elective for both semesters of the senior year, four hours a week. The aim of this course is to equip the student with a general knowledge of classical literature, and a working knowledge of the language as it is spoken and written in the French capital to-day. Drill is furnished in composition, principles of syntax, and sight translation. Students electing Course II must have a good record in Course I or must pass a satisfactory examination therein. Mr. Herrick

Spanish.—Is given this year as a special elective for both semesters, four hours a week. The special aim is to enable students planning future fields of work in Spanish speaking countries to acquire sufficient speaking and writing knowledge of the Castilian dialect to enable them to start to best advantage. Especial attention is given to conversation, the method employed being that found in Marion and Garennes' *Introducción á la Lengua Castellana*. Grammar rudiments, accent and idiomatic difficulties are thoroughly studied; the acquisition of a good working vocabulary is insisted upon and the course is further strengthened by practice in writing from dictation, constant drill in pronunciation, exercises and composition, and the reading of books characteristic of modern Spanish life and customs. Mr. HERRICK

GERMAN.—Course I. Required for both semesters of sophomore year, four hours a week first semester; three hours a week second semester. Facility in translation is the main object in view, with particular reference to scientific writings. The work consists of a study of the rudiments of grammar and of translation. Mr. HERRICK

Course II. Elective for both semesters of senior year, four hours a week. In this course special attention is given to the reading of German literature, particularly the literature pertaining to several branches of natural science. A student taking this course in connection with any science is expected to gain the ability to avail himself of the German literature of his subject, within reasonable limits.

Different books are used from year to year, but the following list will give you an idea of the nature of the work:

Course I. Joynes Meissner's *German Grammar*, Guerber's *Märchen und Erzählungen*, Hauff's *Das Kalte Herz*, Moser's *Der Bibliothekar*. Mr. HERRICK

Course II. Lessing's *Emilia Galotti*, and *Minna von Barnhelm*, Hodge's Courses in *Scientific Reading*.

Students electing Course II must have a good record in Course I, or must pass a satisfactory examination therein.

President GOODELL

MILITARY SCIENCE

In compliance with the provisions of an act of Congress, of July 2, 1862, military instruction under a regular army officer, detailed for this purpose, is required of all able-bodied male students. Men are excused from attendance upon the exercises of this department only on a surgeon's certificate, given by Dr. Charles F. Branch, the college physician.

The object of such instruction is clearly to disseminate the elements of military knowledge throughout the country, that, in case of sudden emergency, a sufficient number of well-trained, educated men may be found to command and properly to instruct volunteer troops. Military drill also has the object in view of giving the student physical exercise, teaching respect and obedience to those in authority, without detracting from pride of manhood, and developing a military bearing and courtesy becoming in a citizen as in a soldier.

In order to further stimulate the study of Military Science in colleges the War Department issued General Orders No. 6, dated Washington, D. C., Aug. 24, 1903, as follows:

The reports of the regular inspections of the colleges and schools to which officers of the army are detailed, in pursuance of law, as principals or instructors, will annually hereafter be submitted to the General Staff for its critical examination, and the chief of staff will report to the Secretary of War, from the institutions which have maintained a high standard, the six institutions whose students have exhibited the greatest interest, application and proficiency in military training and knowledge. The President authorizes the announcement that an appointment as second lieutenant in the Regular Army will be awarded to an honor graduate of each one of the six institutions, provided sufficient vacancies exist after caring for the graduates of the Military Academy at West Point and the successful competitors in the annual examination of enlisted men. * * * * *

By order of the Acting Secretary of War.
Signed S. B. M. Young
Lieutenant General, Chief of Staff.

Course I. Out of doors, an exercise of one hour, three times a week, Mondays, Tuesdays, and Thursdays: infantry drill by squad, company, and battalion; guard mounting, dress parade, inspection, and review; artillery drill by detachment; target practice. A guard is mounted five times in each week and the guard maintained under practical instruction for one hour in each exercise.

All drills are in the drill hall during the winter months and inclement weather.

Students assigned to the college band are given instruction and practice in band music and band evolutions, in place of drills and recitations.

Course II. Theoretical instruction for freshmen, one hour a week for both semesters, comprises recitations in infantry drill regulations. *United States Service Manual.*

Course III. Theoretical instruction for seniors for both semesters, one hour a week, embraces drill and army regulations; duties of sentinels and guard duty; elements of military science; preparation of necessary reports and returns pertaining to a company of infantry; and a thesis on some military subject. Wagner's *Elements of Military Science.*

Captain ANDERSON

SYNOPSIS OF THE COURSES OF INSTRUCTION

The figures indicate the number of exercises a week; light faced type, recitation periods of one hour each; heavy faced type, laboratory periods of two hours each.

FRESHMAN YEAR

First Semester

Language	English	3
	French	4
Mathematics	Algebra	5
Science	Agriculture	4
	Botany **2**+1	3
Military	Tactics	1
History		2
		—22

Second Semester

Language	English	4
	French	4
Mathematics	Geometry and trigonometry,	4
Science	Anatomy and physiology half semester	4
	Chemistry half semester	
	Botany **1**+1	2
History		2
		—20

SOPHOMORE YEAR

First Semester

Language	English	4
	German	4
Physics		4
Science	Agriculture	4
	Chemistry	**3**
	Zoölogy **1**+1	2
		—21

Second Semester

Language	English	4
	German	3
Physics		4
Surveying		**2**
Science	Agriculture 2+**1**	3
	Chemistry	**2½**
	Horticulture	3
		—21½

JUNIOR YEAR

First Semester

Course in Agriculture	Agriculture 3+1	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	Horticulture	3
	English	4
		—20
Course in Horticulture	Horticulture	4
	Horticulture 1+3	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	English	4
		—21
Course in Biology	Zoölogy 3+1	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	Horticulture	3
	English	4
		—20
Course in Chemistry	Chemistry	4
	Agriculture 3+1	4
	Mathematics	4
	Geology	3
	English	4
	Special subject	2
		—21
Course in Mathematics	Analytical geometry	4
	Engineering 1+3	4
	Free hand drawing	2
	Landscape gardening	4
	Geology	3
	English	4
		—21
Course in Landscape Gardening	Landscape gardening	4
	Agriculture 2+1	3
	Botany 2+1	3
	Free hand drawing	2
	Horticulture	3
	Geology	3
	English	4
		—22

Second Semester

Course in Agriculture	Agriculture 2+1	3
	Botany 2+1	3
	Chemistry	**4**
	Horticulture	**2**
	Entomology	**4**
	Economics	4
		—20
Course in Horticulture	Horticulture	4
	Botany 2+1	3
	Chemistry	**4**
	Landscape gardening	2
	Entomology	**4**
	Economics	4
		—21
Course in Biology	Entomology	**4**
	Zoölogy	**3**
	Botany 2+1	3
	Chemistry	**4**
	Horticulture	**2**
	Economics	4
		—20
Course in Chemistry	Chemistry	**5**
	Agriculture 2+1	3
	Mathematics	4
	Economics	4
	Special subject	5
		—21
Course in Mathematics	Engineering	5
	Mathematics	4
	Mechanical drawing	**2**
	Landscape gardening	4
	Economics	4
		—19
Course in Landscape Gardening	Landscape gardening	4
	Botany 2+1	3
	Mechanical drawing	**2**
	Engineering	5
	Entomology	**4**
	Economics	4
		—22

SENIOR YEAR

First Semester

The following subjects are required in all courses:

Bacteriology, half semester **4**	4
Constitution of the United States, half semester 4	
Military science	1
	—5

Second Semester

Constitution of the United States	4
Military science	1

From the following the student must elect three courses, closely correlated with his junior year course. Only one course in language can be elected.

Agriculture	4	Entomology **3+1**	4	English	4
Horticulture **3+1**	4	Chemistry **3+1**	4	French	4
Veterinary	4	Physics	4	German	4
Botany **3+1**	4	Engineering	4	Spanish	4
Landscape gardening	4			Latin	4

Courses of Instruction

FOR THE DEGREES OF MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY

Applicants are not eligible to the degree of Master of Science or of Doctor of Philosophy until they have received the degree of Bachelor of Science or its equivalent.

COURSES FOR THE DEGREE OF MASTER OF SCIENCE

A course of study is offered in each of the following subjects: mathematics and physics, chemistry, agriculture, botany, horticulture, entomology, veterinary science. Upon the satisfactory completion of any two of these the applicant receives the degree of Master of Science.

Candidates for the degree of Master of Science must devote not less than one year and a half after graduation to the prosecution of two studies for the degree, one year of which must be in residence at the Massachusetts Agricultural College.

COURSES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is conferred upon candidates who shall have spent three years of graduate work in this institution and satisfactorily completed a major subject and two minor subjects. Botany, chemistry, entomology or horticulture may be selected as the major. The minors available are botany, chemistry, entomology, horticulture, and zoölogy.

At least three years is necessary to complete the work required: twenty hours per week to be devoted to the major-subject, and from twelve to sixteen to be given to each minor during one and a half years.

A general outline of the work assigned for the major study in each subject is as follows:

Botany. Vegetable physiology, vegetable pathology, mycology, œcology, taxonomy, phylogeny, the history of botany, and the history and theory of evolution. The above subdivisions of botany will be to a greater or less extent, pursued as necessitated by the previous training of the student and nature of the original problem undertaken. In this course, it is also recommended that the student take, in addition to this prescribed minor work, a brief course in the history of philosophy and psychology which at present will have to be provided elsewhere. Extensive reading of botanical literature, of both a general and specific nature, will be required, in certain subjects, and occasional lectures will be given. A botanical conference is held monthly wherein various new problems touching upon botanical science are considered by graduate students and those of the senior class electing botany. A thesis dealing with some economic problem in plant physiology or pathology, or both, and containing a distinct contribution to knowledge will also be required.

Chemistry. Advanced work in the following subjects: inorganic analysis, qualitative, of the rarer elements, and quantitative; crystallography; physical chemistry; descriptive and determinative mineralogy; chemical geology; soil formation; soil physics and chemistry; gas analysis; synthetic inorganic work; chemical theory and history; general organic chemistry; special topics in organic chemistry; elementary quantitative organic analysis; proximate qualitative and quantitative organic analysis, including determination of organic radicles; organic synthesis of aliphatic and aromatic compounds;

problems in chemical manufacture; recent chemistry of plant nutrition; animal physiological and pathological chemistry, including foods, standards for feeding of all kinds, and among secretions, milk and milk industries and among excretions, urine and urinalysis; toxicology; insecticides and fungicides; frequent examinations on current chemical literature.

Early in the course original work on some chemical subject pertaining to agriculture must be begun. The history and results of this work must be submitted before graduation in the form of a thesis containing a distinct contribution to knowledge.

ENTOMOLOGY. *General morphology of insects*: embryology; life history and transformations; histology; phylogeny and relation to other arthropods; hermaphroditism; hybrids; parthenogensis; pædogensis; heterogamy; chemistry of colors in insects; luminosity; deformities of insects; variation; duration of life.

Œcology: dimorphism; polymorphism; warning coloration; mimicry; insect architecture; fertilization of plants by insects; instincts of insects; insect products of value to man; geographical distribution in the different faunal regions; methods of distribution; insect migrations; geological history of insects; insects as disseminators of disease; enemies of insects, vegetable and animal, including parasitism.

Economic entomology: general principles; insecticides; apparatus; special cases; photography of insects and their work; methods of drawing for illustrations; field work on insects and study of life histories; insect legislation.

Systematic entomology: history of entomology, including classifications and the principles of classification; laws governing nomenclature; literature,—how to find and use it; indexing literature; number of insects in collections and existence (estimated); lives of prominent entomologists; methods of collecting, preparing, preserving, and shipping insects ; important collections of insects.

Journal club : assignments of the literature on the different groups of insects to different students who report at monthly meetings summaries of all articles of value which have appeared during the month.

Required readings of the best articles on the various topics named above and on the different orders of insects. This reading covers from 15,000 to 20,000 pages in English, French, and German, and the candidate is examined on this together with his other work at the close of his course.

Thesis: A thesis with drawings, which shall consist of the results of original investigation along one or several lines, and which shall constitute a distinct contribution to knowledge, must be completed and accepted before the final examinations are taken.

HORTICULTURE. The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation, and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself continuously to it. He will be required to attend lectures, conferences, and seminars, dealing with horticulture in its broader aspects. Advanced work will be required in the following subjects : systematic pomology, pomological practice, commercial pomology ; systematic, practical, and commercial olericulture ; greenhouse plants and problems ; floriculture ; landscape gardening ; plant breeding and general evolution ; and questions of a physiological nature connected with propagation and pruning.

Other requirements and opportunities are (1) periodical seminars with special lectures, by prominent men from outside the college; (2) extensive and systematically planned readings; (3) frequent visits to orchards, gardens, greenhouses, estates, and libraries outside the college grounds, always with some definite purpose in view; (4) and finally, the preparation and publication of a thesis setting forth the results of the candidate's major study, which shall be an original and positive contribution to horticultural knowledge.

Courses of Instruction

FOR SPECIAL STUDENTS

A TWO YEARS' COURSE FOR WOMEN

Women are received who wish to pursue the studies named below. There is no charge for tuition. Board may be obtained in the Dining Hall and also rooms, so far as the accommodations will permit.

First year, first semester: soils, fertilizers and cultivation, four hours a week; elementary botany, five hours; French, four hours; free hand drawing, four hours.

Second semester: propagation and pruning (horticulture, one hour) three hours; botany: morphology, plant analysis, five hours; chemistry, descriptive, five hours; vegetable gardening, four hours; French, four hours.

Second year, first semester: pomology, three hours a week; greenhouse construction and management, three hours; botany: structure and physiology of plants, five hours; zoölogy, two hours; chemistry, five hours; German, four hours.

Second semester: landscape gardening, three hours a week; floriculture, four hours; vegetable pathology, five hours; entomology, three hours; chemistry, five hours; German, three hours.

SHORT COURSES

These courses are open to persons of both sexes. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is required.

Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

I. Dairy Farming

	Hours a week
Soils, tillage, and methods of soil improvement: manures and fertilizers and their use; crops and rotations	4
Breeds and breeding of dairy stock; judging to scale of points	2
Fodders and feeding farm live stock	1
Stable construction and sanitation	1
Common diseases of stock; prevention and treatment	1
Dairy products, their general characteristics, testing	2
Chemical composition of milk and of special milk products	1
Botany	2
Horticulture	3
Entomology	3
Dairy practice, including testing, use of separators, buttermaking, preparation of certified and modified milk and pasteurization	4
Practice in horticulture	1

Begins first Thursday in January and continues ten weeks.

II. Horticulture

	Hours a week
Soils, tillage, manures, etc.	4
Plant propagation and pruning	3
General fruit growing	3
Market gardening	3
Botany	4
Entomology	3
Practice work in seed testing, seeding, grafting, budding, transplanting, judging fruit, etc.	

Begins first Wednesday in January; continues ten weeks. This course will not be given unless at least eight men register for it.

III. A Short Course in Bee Culture

This course begins the fourth Wednesday in May and continues two weeks, but will not be given unless applied for by at least six students.

	Total hours
The structure of bees, with special reference to their work	5
Professor H. T. Fernald	
Flowers and fruits in their relations to bees	10
Professor Stone	
Honey crops and how to grow them	5
Professor Brooks	
Bees and bee keepers' supplies	10
Professor Paige	
Work in the apiary, under direction of an expert	20
Instruction by specialists	4

Equipment of the Several Departments

AGRICULTURE

The part of the college estate, assigned to the department of agriculture contains 160 acres of improved land, 40 acres of pasture, and 16 acres of woodland. The latest inventions in improved agricultural tools and machinery are in practical use. The large and commodious barn and stables are stocked with the best breeds of horses, cattle, sheep, and swine. Attached to the barn is a dairy building equipped with the latest machinery driven by an electric motor. The museum contains a collection of implements, seeds, plants, and models of animals, all of which are designed to illustrate the evolution of agriculture. Three large lecture rooms, one in South College, and two in the dairy building have been assigned to this department.

The laboratory is provided with a full line of the latest and most highly improved apparatus for the study of the physical properties and the mechanical analysis of soils. Space for the indoor study of farm-machinery in motion is provided. A dynamometer for determination of the draft of machines and implements; surveyor's instruments for use in drainage problems; and microscopes and germination apparatus for use in seed examination are among the more important of the accessories in this department.

HORTICULTURE AND LANDSCAPE GARDENING

For illustration of the science and the practice of horticulture, the department possesses about 100 acres devoted to orchards planted with the leading old and new varieties of

apples, pears, peaches, plums, cherries, quinces, chestnuts, hickory-nuts, and walnuts; vineyards containing nearly 200 named varieties of grapes, besides many seedlings, and about an acre devoted to a commercial crop of a few market varieties; nurseries containing many kinds of fruit and ornamental trees, shrubs, and plants, in all stages of growth, from the seed and cuttings to those ready for planting out; and small fruit plantations of considerable diversity and extent. Several acres of excellent garden land are devoted to the growing of all the common types of vegetables. All these plantations, as far as possible, are managed according to the best practical and commercial methods, so that students may learn to know not merely the plants themselves but the best methods of handling them at a profit.

There are large well-stocked glass houses to illustrate the principles of greenhouse construction and management. These houses contain a large collection of the economic plants of the world, and also small commercial supplies of those plants such as carnations and chrysanthemums, commonly grown for market. Vegetable growing under glass is practiced to an extent necessary for purposes of illustration.

A fine arboretum of trees and shrubs, native and exotic, furnishes material for the study of students in landscape gardening. Gardens of hardy and tender plants are being continually extended. Actual work in practical landscape gardening, laying drives and walks, planning and planting various areas, is constantly in progress on the college campus.

CHEMISTRY

This department has fourteen rooms well adapted to their special uses. They are supplied with a large assortment of apparatus and chemical materials. The lecture-room on the second floor has a seating capacity for seventy students. Immediately adjoining it are four smaller rooms used for storing apparatus and preparing materials for the lecture table. The laboratory for beginners is a large room on the first floor furnished with forty working tables. Each table is provided with reagents and apparatus for independent work. A well equipped laboratory for advanced work is also provided on the first floor. A weighing room has six balances and improved apparatus for determining densities of solids, liquids, and gases. The apparatus also includes a microscope, a spectroscope, a polariscope, a photometer, a barometer, and numerous models and sets of apparatus. The various rooms are furnished with an extensive collection of industrial charts. A valuable and growing collection of specimens and samples, fitted to illustrate different subjects taught, is also provided. This includes rocks, minerals, soils, raw and manufactured fertilizers, foods, including milk products, fibres, and other vegetable and animal products, and artificial preparations of mineral and organic compounds. Series of preparations are used for illustrating the various stages of different manufactures from raw materials to finished product.

GEOLOGY

Geological teaching is illustrated by a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, models, and charts.

ZOÖLOGY

Zoölogical laboratory.—A large, well-lighted room, situated in the chemical laboratory, is fitted with necessary tables, trays, and general apparatus, microscopes, dissecting instruments, hand-lenses, and the like. There have lately been added aquaria, in which, as far as possible, the various types studied may be seen in their natural environment. A reference library is kept in the laboratory.

Zoölogical lecture room.—An ample lecture room is situated in South College, adjacent to the museum. It is supplied with a set of Leuckart charts and many special ones as well, and with a complete set of Auzoux models illustrative both of human and comparative anatomy. A special set of typical specimens are being set apart for class illustration, although the more extensive museum collection is drawn upon for the same purpose.

Museum of zoölogy.—The museum is mainly for the purpose of exhibiting those forms treated of in the lecture and laboratory courses, but, in addition to this, the aim has been to show as fully as possible the fauna of the Commonwealth and those types which show the evolution and the relationship of the members of the animal kingdom. The total number of specimens contained in the museum now exceeds eleven thousand. The museum is open to the public from 3-30 to 5-30 P. M., each week day.

Entomological laboratory.—The equipment for work in entomology during the senior year and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes, microtomes, reagents, and glass ware. One portion of the building is fitted up as a lecture room. Another room is devoted to library purposes, and contains a card-catalogue of nearly fifty thousand cards, devoted to the literature of insects. In addition to a well-selected list of entomological works in this room, the college library has an unusual number of rare and valuable books on this subject. This is supplemented by the private entomological libraries of the professors in charge, which contain over twenty-five hundred volumes, many of which cannot be found elsewhere in the United States. In another room is a large and growing collection of insects, both adult and in the early stages, which is of much assistance to the students. As the laboratory is connected with the insectary of the Hatch Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray pumps, nozzles, and other articles for the practical treatment of insects ; the chemical room, fitted up for the analysis of insecticides, and other chemico-entomological work ; and a greenhouse, where plants infested by injurious insects are under continual observation, and experimental treatment,—all these are available to the student. In addition, several private laboratory rooms and a photographing room with an unusually good equipment of cameras are provided. The large greenhouses, grounds, gardens, and orchards of the college are also to be mentioned under this head, providing for study, as they do, a wide range of subjects relating to the attacks of injurious insects under natural conditions.

VETERINARY SCIENCE

The department has for its sole use a commodious and modern laboratory and hospital-stable erected in 1899. Both buildings are constructed according to the latest ideas as regards sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation, and disinfection.

The laboratory building contains a large working laboratory for students' use, and several small private laboratories for special work. In addition there are a lecture hall, museum, demonstration room, photographing room, and work shop. The hospital stable contains a pharmacy, operating hall, post-mortem and dissecting room, besides a section for poultry, one for cats and dogs, and six sections separated from each other, for the accommodation of horses, cattle, sheep, swine, and other domestic animals.

The laboratory equipment consists of a dissecting Auzoux model of the horse, Auzoux models of the foot and the legs, showing the anatomy and the diseases of every part. There are skeletons of the horse, cow, sheep, dog, and pig, and in addition a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts, and diagrams, which are made use of in connection with lectures and demonstrations.

The laboratories are supplied with the most modern, high-power microscopes, microtomes, incubators, sterilizers, for the use of students taking the work in bacteriology and parasitology.

BOTANY

The botanical department possesses a general laboratory furnished with tables and benches for microscopic and physiological work and with a dark closet for photographic purposes. There are forty-six compound microscopes, thirty dissecting microscopes, a micro-photographic and landscape camera, and various accessories; also microtomes, paraffine baths, etc., for histological work; a large and useful collection of physiological apparatus for the study of photo-synthesis, respiration, metabolism, transpiration, heliotropism, and other irritable phenomena connected with plants; a set of apparatus for the study of the mechanical constituents of the soil, and for experimental work in soil physics. The laboratory is equipped with various devices for the study of mechanics of plant structure; several types of self-registering auxanometers used to measure the rate of growth of plants; self-registering thermometers, and hygrometers for recording constant changes in conditions.

Botanical lecture room.—The botanical lecture room adjoining the laboratory is adapted for general work in morphology and flower analysis with opportunity to use dissecting microscopes.

Botanical museum.—Directly over the botanical lecture room is a museum. It contains a collection of valuable material now undergoing rearrangement and enlargement. There is a collection of spraying solutions; an economic collection of seeds, the principal Massachusetts timber trees, with photographs and sections of the same, and many cases of interesting examples of natural and artificial grafts, girdlings, etc.

Connected with the museum is an herbarium containing about 15,000 species of flowering plants and ferns, 1,200 species of mosses, 1,200 species of lichens and liverworts, and 12,000 species of fungi, the latter collection being housed in the vegetable pathology building at the experiment station.

Adjacent to the botanical laboratory and lecture room are named collections of native and exotic trees. The various conservatories of the college and the experiment station representing over 13,000 square feet of ground surface devoted to the cultivation of a large variety of exotic plants are also available.

MATHEMATICS, PHYSICS, AND ENGINEERING

SURVEYING

The department possesses a considerable number of the usual surveying instruments with the use of which the students are required to become familiar by performing a required amount of field work. Among the larger instruments are two plain compasses, railroad compass with telescope, surveyor's transit, two engineer's transits with vertical arc and level, solar compass, omnimeter with verniers reading to ten seconds, adapted to geodetic work, Queen plane table, two wye levels, dumpy level, builder's level, sextant, hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For draughting, a vernier protractor, pantograph, parallel rule, etc., are available.

PHYSICS

Among the apparatus in use for general instruction in general physical processes may be found a set of United States standard weights and measures, precision balances, spherometer, vernier calipers, etc.; in mechanics, apparatus to illustrate the laws of falling bodies, systems of pulleys and levers, motion on an incline plane, and the phenomena connected with the mechanics of liquids and gases. The usual apparatus for lecture illustration in heat, light, and sound are also in the possession of the department. In electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, among which may be enumerated a full set of Weston ammeters, and volt meters, a Carhart-Clark standard cell, Mascart quadrant electrometer, Siemens electro-dynamometer as well as reflecting galvanometers and Wheatsone bridges for ordinary determinations of currents and resistance.

MILITARY SCIENCE

In addition to a large campus, suitable for battalion drill, the military department possesses a special building in which there is a drill room 60 by 135 feet, an armory, a recitation room, an office for the commandant, and a field-gun and gallery practice room. The building also has a large bathroom immediately adjoining the armory.

In a plot of ground north of the college buildings there is a rifle range, marked for practice at distances of 100 and 200 yards. The range is furnished with a revolving target suitably protected by earthworks. The national government supplies, for the use of the department, arms and equipments: the Springfield cadet rifle and two breech-loading rifled steel guns, calibre 3.2, with complete equipments and ammunition.

The State supplies instruments for the college band.

Students are held responsible for all articles of public property while in their possession.

THE CHAPEL-LIBRARY BUILDING

One of the most attractive and commodious buildings belonging to the college is the chapel-library. It has a commanding position, approximately in the center of the group of buildings adjoining the campus. The chapel occupies the entire second story. A large room, capable of seating about four hundred, is used for daily prayers, Sunday services, the various commencement exercises, and not infrequently for lectures or social gatherings. The room has an excellent pipe-organ. Two adjoining rooms are used for small religious gatherings, and meetings of the class teachers and of the faculty. The rooms can be thrown open so as to become a part of the main audience hall.

The entire lower story is given over to the library. This library is available for reference or investigation, and is open daily, except on Sundays, from 8 A. M. to 5 P. M. and from 6-30 to 8-30 P. M. It is open on Sundays from 10 A. M. to 1 P. M. The volumes at present number 24,534. The library contains carefully selected books in the departments of agriculture, horticulture, botany, entomology, and other natural sciences. Sociology, economics, history, literature, the fine arts, and the useful arts are well represented. Constant additions will be made to secure the latest and best works in the several departments of learning.

DINING-HALL

A colonial dining-hall, built of brick and equipped with all modern conveniences, was completed and opened February, 1903, for the accommodation of students. A committee composed of two members of the faculty, two members of the student body, and the steward, manages the affairs of the dining-hall,

The hall contains a number of suites of rooms which may be secured for occupancy by young women attending any of the departments of the college.

THE HEATING, LIGHTING, AND POWER PLANT

This plant is located in the ravine near the chemical laboratory. It is equipped with two large boilers, an engine, and an electric generator. Here steam is generated which heats the college buildings on the west side of the public highway, extending from the dining hall to veterinary laboratory. Here also is produced the electricity which lights all the buildings and the grounds of the college. Electric power is also generated which is used to drive the machinery in the dairy and in the barn. Connected with the plant is a machine shop in which much work is done for the college. The plant affords opportunity for students in mechanical and electrical engineering to observe the modern utilization of steam and of electricity.

General Information

DORMITORIES

Students are expected to occupy rooms in the college dormitories unless excused to room elsewhere.

In North College and South College rooms, unfurnished, are arranged in suites of three. Each apartment consists of one study room and two bedrooms. In North College the corner rooms are 14 by 15 feet, and the annexed bedrooms 8 by 10 feet. The inside study rooms are $13\frac{1}{2}$ by $14\frac{1}{2}$ feet, and the bedrooms 8 by 8 feet. In South College the study rooms are 14 by 15 feet with a recess $7\frac{1}{3}$ by 3 feet, and the bedrooms $11\frac{1}{6}$ by $8\frac{5}{12}$ feet. Both buildings are heated by steam and lighted by electricity.

Students are required to care for their rooms. Military inspection by the commandant takes place every Saturday morning at 8-30 o'clock.

Rent varies according to the building and the location from $15 to $45 a year. Steam heat costs $12 yearly. Lights cost $12 yearly. Board is furnished in the college dining hall at present for $3.25 a week. Rooms in the dining-hall are reserved for women who are students in any department of the college. The rent is $18 a semester ; light and heat extra, $12 each per semester.

Correspondence relative to the engaging of rooms should be addressed to Thomas Canavan, the janitor.

EXPENSES

Room rent, in advance	$15.00	$45.00
Board, $3.25 to $4 per week	117.00	144.00
Fuel	13.00	13.00
Washing, 30 to 60 cents a week	11.00	22.00
Military suit	12.50	20.00
Lights	12.00	12.00
	$180.50	$256.00

In addition to the above expenses, $80 tuition is charged to foreigners.

The military suit must be obtained immediately upon entering college, and used in the drill exercises prescribed. The following fees are applied towards the maintenance of the several laboratories: chemical, $15 per semester used; zoölogical, $2 per semester used sophomore year; other classes $4 per semester; entomological, $3 per semester used. The fee for use of the botanical laboratory for two periods of one hour during each week is $1 per semester. Other periods will be charged for proportionally. Some expense is also incurred for text-books. In exceptional cases incidental expenses necessitate additional charges.

THE LABOR FUND

An annual appropriation of $5000 is received from the State. The object of this fund is to assist those students who are residents of Massachusetts and are dependent either wholly or in part on their own exertions, by furnishing them work in the several departments of the college. The greatest opportunity for such work is found in the agricultural, and the horticultural department.

Application for participation in the benefits of the labor fund should be made to the president of the college. Students desiring to avail themselves of its benefits must bring a certificate signed by one of the selectmen of the town in which they are resident, certifying to the fact that they require aid.

SELF-HELP

Good opportunities are afforded for self-support in part to those students who choose to avail themselves of them. But much depends upon the determination and the ability of the student applying for work. Some exceptional men have succeeded in paying their way through college. Not a few have paid a large share of their necessary expenses. Many have earned a small part of the cost of their college course. But in every case the student should have funds enough to pay his way until he can adapt himself to his new environment and show what he is capable of earning. The long summer vacation allows the student to earn good wages at home or elsewhere. There are no college exercises on Saturdays so that work for wages may then be performed. But no student should attempt to engage in work that will interfere with his success in his studies. The labor fund is employed in paying for the labor of students who require work, but the fund is limited and the college cannot promise employment to all applicants. Each case must be determined according to the circumstances of the time and the qualifications of the man.

RELIGIOUS SERVICES

Chapel services are held every week-day except Saturday at 8 A. M. A religious meeting Thursday evening, under the auspices of the College Young Men's Christian Association is held in the chapel. Students are expected to attend divine service on Sunday with the churches of their choice in town, where a cordial welcome is accorded them.

FELLOWSHIP

A fellowship under the title of "Instructor in Chemistry" is offered to a recent graduate who desires, in connection with his regular duties as instructor, to carry on advanced work for one or more years.

SCHOLARSHIPS

ESTABLISHED BY PRIVATE INDIVIDUALS

Mary Robinson fund of one thousand dollars, the bequest of Miss Mary Robinson, of Medfield.

Whiting Street fund of one thousand dollars, the bequest of Whiting Street, Esq., of Northampton.

Henry Gassett fund of one thousand dollars, the bequest of Henry Gassett, Esq., of North Weymouth.

The income of these funds is assigned to worthy students requiring aid.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms of such application may be obtained from the president of the college.

DEGREES

No honorary degrees are conferred.

Those who complete the four years' course will receive the degree of Bachelor of Science. The diploma is signed by the governor of the Commonwealth as well as by the president of the college.

Those who receive this degree may receive also the degree of Bachelor of Science from Boston University, for which a fee of ten dollars is charged; provided that the candidate in addition to the college course shall have mastered in a preparatory school a three years' preparatory course in studies beyond those commonly presented in the grammar schools of Massachusetts.

Those who complete the assigned courses will receive the degree of Master of Science for which a fee of ten dollars must be paid to the treasurer of the college.

Those who complete the three years' course of study required and present a satisfactory thesis will be given the degree of Doctor of Philosophy. The fee for this degree is twenty-five dollars.

Those to whom degrees are awarded must present themselves in person at commencement to receive them.

Prizes

The following prizes are offered annually for proficiency in the work of several of the departments of collegiate study:

AGRICULTURE

The Grinnell prizes, the first of twenty-five dollars, and the second of fifteen dollars, given by Hon. William Claflin, of Boston, in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who produce the best and the second best examinations, oral and written, in theoretical and practical agriculture.

BOTANY

The Hills prizes of thirty-five dollars, given by Henry F. Hills of Amherst, will this year be awarded to members of the senior class as follows: fifteen dollars for the best general herbarium, fifteen dollars for the best collection of Massachusetts trees and shrubs, and five dollars for the best collection of Massachusetts grasses.

ENGLISH

The Flint prizes, the first of thirty dollars, and the second of twenty dollars, given by Mr. Charles L. Flint, of Boston, of the class of 1881, to those members of the junior class, under certain restrictions, who produce the best and the second best orations. Both composition and delivery are considered in making the award.

The Burnham prizes, amounting in all to eighty dollars, given by the late T. O. H. P. Burnham, of Boston, to members

of the sophomore, and the freshman class, for excellence in composition work and in declamation. Composition work, in competition for these prizes is confined to the second semester of the sophomore year. Under certain restrictions, a first prize of twenty dollars, a second prize of ten, and a third prize of five are awarded. Declamation work, in competition for these prizes is confined to the second semester of freshman year. Under certain restrictions, a first prize of twenty-five dollars, and a second prize of twenty are awarded.

SPECIAL PRIZES

Special prizes are occasionally offered by various departments.

MILITARY DIPLOMAS

The commandant is authorized to give military diplomas, countersigned by the president of the college, to those men receiving the degree of Bachelor of Science who by their work in the military department during their course in college may have shown themselves worthy of distinction. These diplomas recommend those receiving them for commissions in the United States army or in the militia of the several states, vouching that they are fitted to fill the position of a commissioned officer.

WINTER COURSE PRIZES

The Dairy prizes, given by the Massachusetts Society for Promoting Agriculture, to members of the short winter course. Two sets of prizes are offered. The first set consists of three prizes of fifty, thirty, and twenty dollars, respectively, given for general excellence in all branches of the course as offered. The second set consists of three prizes of twenty-five, fifteen, and ten dollars, respectively, for excellence in the making of butter.

Award of Prizes

1902—1903

Grinnell Agricultural Prizes—Senior

First prize: Paul Nerses Nersessian
Second prize: Elmer Myron Poole

Hills Botanical Prizes—Senior

First prize: Albert Vincent Osmun
Second prize: Gerald Denison Jones

Flint Oratorical Prizes—Junior

First prize: Fayette Dickinson Couden
Second prize: George Edmund O'Hearn

Burnham Declamation Prizes—Sophomore and Freshman

First sophomore prize: William Hunlie Craighead
Second sophomore prize: George Howard Allen
First freshman prize: Vernon Ollise White
Second freshman prize: Alonzo Henry Shannon

Military Honors—Senior

The following cadets were reported to the Adjutant General U. S. Army, and to the Adjutant General of Massachusetts, as having shown special aptitude for military service:

William E. Allen
George L. Barrus
Neil F. Monahan

Short Course in Dairy Farming

Massachusetts Society for Promoting Agriculture: for general excellence: first prize, $50, Mrs. Sara E. Folsom; second prize, $30, Samuel W. Dorling; third prize, $20, Nelson Gerber.

Massachusetts Society for Promoting Agriculture: for highest scoring butter: first prize, $25, Clarence H. Stygles; second prize, $15, William A. Gage; third prize, $10, Samuel W. Dorling.

Massachusetts Society for Promoting Agriculture: for excellence in stock judging: first prize, $10, Samuel W. Dorling; second prize, $7.50, Elmer P. Ramsdell; third prize, $5, Herman Kohles; fourth prize, $2.50, James Gould.

Special prize offered by W. H. Bowker of Boston: for best knowledge of the use of fertilizers on the farm: one ton Stockbridge fertilizer, Mrs. Sara E. Folsom.

Special prize given by B. von Herff, New York: for best knowledge of the use of fertilizers on grass lands: one ton kainite; William A. Gage.

Degrees Conferred in 1903

DOCTOR OF PHILOSOPHY

Morrill, Austin Winfield	Tewksbury

BACHELOR OF SCIENCE

Allen, William Etherington†	Winthrop
Bacon, Stephen Carroll†	Leominster
Barrus, George Levi†	Goshen
Bowen, Howard Chandler†*	Rutland
Brooks, Philip Whitney†*	Cambridge
Cook, Joseph Gershom†	Clayton
Franklin, Harry James†*	Bernardston
Halligan, Charles Parker†	Roslindale
Harvey, Lester Ford†	Woodbury, Conn.
Hood, William Lane†*	Vandiver, Ala.
Jones, Gerald Denison†*	South Framingham
Lamson, George Herbert†*	East Hampton, Conn.
Monahan, Neil Francis†	South Framingham
Nersessian, Paul Nerses†*	Marash, Turkey
Osmun, Albert Vincent†*	Danbury, Conn.
Parsons, Albert†	North Amherst
Peebles, William Warrington†	Washington, D. C.
Poole, Elmer Myron†*	North Dartmouth
Proulx, Edward George†	Hatfield
Robertson, Richard Hendrie†	Somerville
Snell, Edward Benaiah†	Lawrence
Tinkham, Charles Samuel†	Roxbury
Tottingham, William Edgar†	Bernardston
Tower, Winthrop Vose†	Melrose Highlands
West, Myron Howard†*	Belchertown
Total	25

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* Degree of Boston University

† Military Diploma

Graduate Students

For the Degree of Ph. D.

Franklin, Henry James B. Sc. Massachusetts Agricultural College 1903	Bernardston
Hodgkiss, Harold Edward B. Sc. Massachusetts Agricultural College 1902	Wilkinsonville
Osmun, Albert Vincent B. Sc. Massachusetts Agricultural College 1903	Brooklyn, N. Y.
Tottingham, William Edgar B. Sc. Massachusetts Agricultural College 1903	Bernardston
Total	4

Special Students

TWO YEARS' COURSE FOR WOMEN

Hunt, Justine	*Newton*	Dining Hall

Russell, Ida Josephine	*Amherst*	
Mills, Belle Ingalls Lovejoy	*Amherst*	
	Total	3

Undergraduate Students

SENIOR CLASS

Ahearn, Michael Francis	*South Framingham*	Plant House
Back, Ernest Adna	*Florence*	Insectary
Blake, Maurice Adin	*Millis*	10 South College
Couden, Fayette Dickinson	*Washington, D. C.*	17 South College
Elwood, Clifford Franklin	*Green's Farms, Conn.*	96 Pleasant St.
Fulton, Erwin Stanley	*Lynn*	Hatch Exp. Sta. Chemical
Gilbert, Arthur Witter	*West Brookfield*	11 South College
Gregg, John William	*Dorchester*	24 North College
Griffin, Clarence Herbert	*Winthrop*	14 South College
Haskell, Sidney Burritt	*Southbridge*	20 South College
Henshaw, Fred Forbes	*Templeton*	20 South College
Hubert, Zachary Taylor	*Pride, Ga.*	28 North College
Newton, Howard Douglas	*Stockbridge*	4 South College
O'Hearn, George Edmund	*Pittsfield*	27 North College
Parker, Sumner Rufus	*Brimfield*	Hatch Exp. Sta. Botanical
Peck, Arthur Lee	*Hartford, Conn.*	11 South College
Quigley, Raymond Augustine	*Brockton*	7 South College
Raymoth, Reuben Raymond	*Goshen*	D. G. K. House
Staples, Parkman Fisher	*Westboro*	12 South College
White, Howard Morgan	*Springfield*	9 South College

Total 20

JUNIOR CLASS

Adams, Richard Laban	*Jamaica Plain*	E. M. Dickinson's
Allen, George Howard	*Somerville*	15 South College
Barnes, Hugh Lester	*Stockbridge*	4 South College
Bartlett, Francis Alonzo	*Belchertown*	116 Pleasant St.
Craighead, William Hunlie	*Boston*	28 North College
Crosby, Harvey Davis	*Rutland*	23 North College
Cushman, Esther Cowles	*Amherst*	31 North Prospect St.
Gardner, John Joseph	*Milford*	Plant House
Hall, Arthur William, Jr.	*North Amherst*	North Amherst
Hatch, Walter Bowerman	*Falmouth*	6 South College
Hill, Louis William	*Bridgeport, Conn.*	6 South College
Holcomb, Charles Sheldon	*Tariffville, Conn.*	5 South College
Hunt, Thomas Francis	*Amherst*	Hatch Exp. Station
Hutchings, Frank Farley	*South Amherst*	116 Pleasant St.
Ingham, Norman Day	*Granby*	12 South College
Kelton, James Richard	*Orange*	D. G. K. House
Ladd, Edward Thorndike	*Winchester*	D. G. K. House
Lewis, Clarence Waterman	*Melrose Highlands*	23 North College
Lyman, John Franklin	*Amherst*	D. G. K. House
Munson, Willard Anson	*Aurora, Ill.*	15 South College
Newhall, Edwin White, Jr.	*San Francisco, Cal.*	84 Pleasant St.
Patch, George Willard	*Arlington Heights*	16 South College
Richardson, Justus Cutter	*Dracut*	86 Pleasant St.
Sanborn, Monica Lillian	*Salem*	Dining Hall
Sears, William Marshall	*Brockton*	14 South College
Swain, Allen Newman	*Dorchester*	116 Pleasant St.
Taylor, Albert Davis	*Westford*	86 Pleasant St.
Tompson, Harold Foss	*Roxbury Crossing*	Veterinary Lab.
Tupper, Bertram	*Barre*	Hatch Experiment Station
Walker, Lewell Seth	*Natick*	24 North College
Whitaker, Chester Leland	*Somerville*	17 South College
Williams, Percy Frederic	*Natick*	5 South College
Willis, Grenville Norcott	*Becket*	16 South College
Yeaw, Frederick Loring	*Winthrop*	Hatch Exp. Sta. Botanical
	Total	34

SOPHOMORE CLASS

Baird, Clarence Henry	*Holyoke*	96 Pleasant St.
Carey, Daniel Henry	*Rockland*	2 South College
Carpenter, Charles Walter	*Monson*	D. G. K. House
Chapman, George Henry	*New Britain, Ct.*	8 South College
Colton, William Wallace	*Pittsfield*	21 North College
Cutter, Frederick Augustus	*Pelham, N. H.*	9 South College
Farrar, Allan Dana	*Amherst*	21 Northampton Rd.
Ferren, Frank Augustus	*Peabody*	86 Pleasant St.
Filer, Harry Burton	*Dwight*	27 North College
French, George Talbot	*Tewksbury*	18 South College
Gaskell, Edwin Francis	*Hopedale*	Beers' House
Hartford, Archie Augustus	*Westford*	96 Pleasant St.
Hastings, Addison Tyler, Jr.	*Natick*	9 North College
Hayward, Afton Smith	*Amherst*	101 N. Pleasant St.
Hood, Clarence Ellsworth	*Millis*	7 North College
Jones, Louis Franklin	*Somerville*	56 Pleasant St
Kennedy, Frank Henry	*South Boston*	8 South College
Martin, James Edward	*Brockton*	2 South College
Moseley, Louis Hale	*Glastonbury, Conn.*	10 North College
Mudge, Everett Pike	*Swampscott*	12 North College
Paige, George R.	*Amherst*	6 North College
Peakes, Ralph Ware	*Newtonville*	10 South College
Pray, Fry Civille	*Natick*	14 North College
Racicot, Arthur Alphonse, Jr.	*Lowell*	25 North College
Rogers, Stanley Sawyer	*Boston*	D. G. K. House
Russell, Henry Merwin	*Bridgeport, Conn.*	10 North College
Scott, Edwin Hobart	*Somerville*	D. G. K. House
Sleeper, George Warren	*Swampscott*	86 Pleasant St.
Strain, Benjamin	*Mt. Carmel, Conn.*	9 North College
Suhlke, Herman Augustus	*Leominster*	D. G. K. House
Taft, William Otis	*East Pepperell*	8 South College
Tirrell, Charles Almon	*Plainfield*	Professor Cooley's
Watkins, Fred Alexander	*Peru*	6 North College
Wellington, Richard	*Waltham*	Beers' House
Wholley, Michael Francis	*Cohasset*	22 North College
Wood, Alexander Henry Moore	*Easton*	D. G. K. House
Wood, Herbert Poland	*Hopedale*	Beers' House

Total 37

FRESHMAN CLASS

Alley, Harold Edward	*Newburyport*	44 Triangle St.
Amsden, Eugene Charles	*Gardner*	1 Fearing St.
Armstrong, Arthur Huguenin	*Hyde Park*	44 Triangle St.
Barlow, Waldo Darius	*Amherst*	133 Main St.
Bartlett, Earle Goodman	*Chicago, Ill.*	44 N. Pleasant St.
Brydon, Robert Parker	*Lancaster*	26 North College
Caruthers, John Thomas	*Columbia, Tenn.*	24 North College
Chace, Wayland Fairbanks	*Middleboro*	1 Fearing St.
Chadwick, Clifton Harland	*Cochituate*	1 South College
Chapman, Joseph Otis	*Brewster*	1 Fearing St.
Chapman, William Spaulding	*Attleboro*	11 North College
Clark, Milford Henry, Jr.	*Sunderland*	36 Amherst House
Clementson, Lewis Towland	*Millbury*	Beers' House
Cowles, Edward Russell	*Deerfield*	101 Pleasant St.
Curtis, Jesse Gerry	*South Framingham*	123 Pleasant St.
Curtis, Walter Leon	*Scituate*	31 North College
Dearth, George Augustus	*Sherborn*	1 Fearing St.
Denham, Edwin Tirrell	*Rockland*	77 Pleasant St.
Dickinson, Walter Ebenezer	*North Amherst*	North Amherst
Dudley, Fred Samuel	*Montague*	1 Fearing St.
Eastman, Jasper Fay	*Townsend*	1 Fearing St.
Engstrom, Nils	*Lancaster*	26 North College
Finkelstein, David	*Philadelphia, Pa.*	
French, Vida Rachel	*Cincinnati, O.*	25 Sunset Ave.
Gould, Harry Wheeler	*Millbury*	Beers' House
Green, Herbert Henry	*Spencer*	1 Fearing St.
Hall, Walton, Jr.	*Marshfield*	116 Pleasant St.
Hanson, Stuart Waldo	*Boston*	31 North College
Higgins, Arthur William	*Westfield*	Mr. R. J. Goldberg's
Jones, Arthur Merrick	*Ludlow*	13 South College
Kalina, Jacob	*Amherst*	
King, Clinton	*Easton*	77 Pleasant St.
Knox, Harry Cobb	*Roxbury*	56 N. Pleasant St.
Lanigan, William Joseph	*Rockland*	
Larned, Adelbert Joseph	*Amherst*	Mill Valley, Amherst
Leighton, Carl	*Lowell*	25 North College

Leominster, William	*Longplain*	1 Fearing St.
Lincoln, Ernest Avery	*Fall River*	96 Pleasant St.
Livers, Susie Dearing	*Boston*	Dining Hall
Marran, Bernerd James	*Great Barrington*	
Parker, Charles Morton	*Newtonville*	56 Pleasant St.
Perkins, Edward Cook	*Springfield*	101 Pleasant St.
Peters, Frederick Charles	*Lenox*	13 South College
Philbrick, Edwin Daniels	*West Somerville*	1 South College
Pierce, Henry Tyler	*West Millbury*	Beers' House
Pray, Rutledge Peyton	*Natick*	14 North College
Raitt, John Archibald	*New York, N. Y.*	Dickinson House
Rice, Charles Arthur Allenham	*Springfield*	96 Pleasant St.
Russell, Herbert Osborne	*North Hadley*	North Hadley
Searle, George Whitney	*Westfield*	1 Fearing St.
Shaw, Chester Linus	*Brockton*	77 Pleasant St.
Shaw, Edward Houghton	*Belmont*	Allen St.
Shaw, Frank Elmer	*Brockton*	77 Pleasant St.
Shuttleworth, Edwin Lewis	*Lawrence*	12 Pleasant St.
Smith, George Franklin	*Barre*	1 Fearing St.
Stoddard, Calder Sankey	*Canton*	Allen St.
Summers, John Nicholas	*Campello*	97 Pleasant St.
Thompson, Clifford Briggs	*Halifax*	97 Pleasant St.
Walker, James Hervey	*Greenwich Village*	77 Pleasant St.
Watts, Ralph Jerome	*Littleton*	101 Pleasant St.
Whitney, John Frank	*Dana*	77 Pleasant St.

Total 61

Summary

Graduates	4
Special students	3
Seniors	20
Juniors	34
Sophomores	37
Freshmen	61
Winter course, 1903	28
Total	—187

Alumni Associations

ASSOCIATE ALUMNI

Founded 1874

President, Herbert Myrick, '82, Springfield
Secretary, James B. Paige, '82, Amherst

ALUMNI CLUB OF MASSACHUSETTS

Founded 1885

President, Madison Bunker, '75, Newton
Clerk, Franklin W. Davis, '89, Roslindale

MASSACHUSETTS AGRICULTURAL COLLEGE CLUB OF NEW YORK

Founded 1886

President, Charles O. Lovell, '78, New Rochelle, N. Y.
Treasurer, Alvan L. Fowler, '80, New York, N. Y.

WESTERN ALUMNI ASSOCIATION

President, Everett B. Bragg, '75, Chicago, Ill.
Secretary, Arthur B. Smith, '95, Chicago, Ill.

CONNECTICUT VALLEY ALUMNI ASSOCIATION

Founded 1902

President, R. W. Lyman, '71, Northampton
Secretary, H. D. Hemenway, '95, Hartford

Class Secretaries

1871. E. E. Thompson, Worcester
1872. S. T. Maynard, Northboro
1873. C. Wellington, Amherst
1874.
1875. M. Bunker, Brighton
1876. C. F. Deuel, Amherst
1877.
1878. C. O. Lovell, New Rochelle, N. Y.
1879. R. W. Swan, Worcester
1880.
1881. J. L. Hills, Burlington, Vt.
1882. G. D. Howe, Portland, Me.
1883. S. M. Holman, Attleboro
1884. L. Smith, Springfield
1885. E. W. Allen, Washington, D. C.
1886.
1887. F. H. Fowler, Boston
1888.
1889. C. S. Crocker, Boston
1890. F. W. Mossman, Westminster
1891.
1892. H. M. Thomson, Thompson, Conn.
1893. F. A. Smith, Hopedale
1894. C. F. Walker, Montclair, N. J.
1895. H. A. Ballou, Barbadoes, W. I.
1896.

1897.	C. A. Peters, Moscow, Idaho
1898.	S. W. Wiley, Baltimore, Md.
1899.	D. A. Beaman, Hartford, Conn.
1900.	E. K. Atkins, Northampton.
1901.	J. H. Chickering, Dover
1902.	H. L. Knight, Amherst
1903.	G. D. Jones, North Amherst

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CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

ENSE PETIT PLACIDAM SVB LIBERTATE QVIETEM

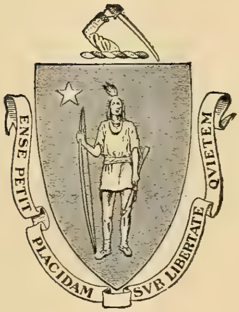
1904-1905

CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

1904-1905



AMHERST
PUBLISHED BY THE COLLEGE
1905

PRESS OF CARPENTER & MOREHOUSE,
AMHERST, MASS.

Calendar for 1904-1905

1904			
September	22	THURSDAY	First semester begins at 8 A. M.
November	24	THURSDAY	Thanksgiving Day
December	21	WEDNESDAY	Holiday recess begins at 8 A. M.
1905			
January	4	WEDNESDAY	8 A. M. Holiday recess ends. Short course begins
February	8	WEDNESDAY	First semester ends
February	9	THURSDAY	8 A. M. Second semester begins
March	15	WEDNESDAY	Short Course ends
March	29	WEDNESDAY	8 A. M. Spring recess begins.
April	4	TUESDAY	8 A. M. Spring recess ends
June	17	SATURDAY	Grinnell prize examination of senior class in Agriculture
June	18	SUNDAY	Baccalaureate Sermon
June	19	MONDAY	Flint prize oratorical contest Burnham prize speaking
June	20	TUESDAY	Meeting of the alumni Class day exercises, battalion drill, reception by the president and the trustees
June	21	WEDNESDAY	Commencement exercises
June	22, 23	THURSDAY AND FRIDAY	8-30 A. M. Examinations for admission at Botanic Museum, Amherst; Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; Pittsfield; Horticultural Hall, Worcester

Vacation of Thirteen Weeks

September	**19-20**	TUESDAY AND WEDNESDAY	8-30 A. M. Examinations for admission, Botanic Museum
September	**21**	THURSDAY	8 A. M. First semester begins
November	**30**	THURSDAY	Thanksgiving Day
December	**20**	WEDNESDAY	Holiday recess begins at 8 A. M.
1906			
January	3	WEDNESDAY	8 A. M. Holiday recess ends. Short course begins
February	7	WEDNESDAY	First semester ends
February	8	THURSDAY	8 A. M. Second semester begins

Origin, Object, and Location

The Massachusetts Agricultural College was among the first of the institutions to be established under the provisions of the National Land-Grant Act of 1862. This Act donated "public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." The framer of this bill was the late Senator Justin Smith Morrill of Vermont. At the present time over sixty institutions of higher learning in this country directly owe their origin or their prosperity to the benefits of this great educational measure.

The college was incorporated in 1864 by an Act of the State Legislature; and on the second of October, 1867, was formally opened to an entering class of thirty-three.

In January, 1875, an arrangement was made with the authorities of Boston University, whereby the college, without losing its independence, should thereafter become the "School of Agriculture" of the university. By means of this arrangement students of the Massachusetts Agricultural College, besides obtaining the regular diploma of the college, which is accepted by American universities and by the University of Göttingen, in Germany, may, upon payment of a fee, and under certain conditions, receive the diploma in science awarded to graduates of the Boston institution. In 1882 the State Experiment Station was located on the college grounds. The station has since become connected with the college.

The college offers a free education to any American student who may be of good character and who may fulfil the requirements for admission. Women are admitted to the courses of the institution with a few exceptions on the same conditions as men. It also offers its courses of study to foreign students upon payment by them of a tuition fee. It gives a four years' course leading to the degree of Bachelor of Science, and graduate courses leading to the degrees of Master of Science and of Doctor of Philosophy. It also offers winter courses of ten weeks, and a special course of two weeks in bee culture.

The college is situated in the beautiful town of Amherst. The grounds are especially attractive, and comprise over 400 acres of land, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent.

Amherst is ninety-seven miles west of Boston. It is on the line of the Southern Division (Central Massachusetts Railroad) of the Boston and Maine Railroad, as well as on that of the Central Vermont Railroad. Electric cars connect with Northampton and Holyoke.

The Corporation

	Term expires
WILLIAM H. BOWKER, Boston	1906
GEORGE H. ELLIS, Boston	1906
J. HOWE DEMOND, Northampton	1907
ELMER D. HOWE, Marlborough	1907
NATHANIEL I. BOWDITCH, Framingham	1908
WILLIAM WHEELER, Concord	1908
ARTHUR G. POLLARD, Lowell,	1909
CHARLES A. GLEASON, New Braintree	1909
JAMES DRAPER, Worcester	1910
SAMUEL C. DAMON, Lancaster	1910
MERRITT I. WHEELER, Great Barrington	1911
CHARLES H. PRESTON, Danvers	1911
WILLIAM R. SESSIONS, Springfield	1912
M. FAYETTE DICKINSON, Boston	1912

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Acting President

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Professor of Chemistry

Charles Wellington, A.M., Ph.D. . . 34 Amity St.
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Professor of Zoölogy

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Professor of Agriculture

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Professor of English and Latin

James B. Paige, D.V.S. . . . . 42 Lincoln Ave.
Professor of Veterinary Science

George E. Stone, Ph.D. . . . Mount Pleasant
Professor of Botany

John E. Ostrander, A.M., C.E. . 33 North Prospect St.
Professor of Mathematics and Civil Engineering

Henry T. Fernald, M.Sc., Ph.D. . . 44 Amity St.
Professor of Entomology

John Anderson, Major, U.S.A., Retired . . . Amherst House
Professor of Military Science and Tactics

Frank A. Waugh, M.Sc. . . . M. A. C.
Professor of Horticulture

Richard S. Lull, M.Sc., Ph.D. . . 14 Maple Ave.
Associate Professor of Zoölogy and Curator of the Zoölogical Museum

Philip B. Hasbrouck, B.Sc. . . . 130 Pleasant St.
Associate Professor of Mathematics and Adjunct Professor of Physics

Herman Babson, A.M. . . . . 3 College St.
Assistant Professor of English and Instructor in German

Fred S. Cooley, B.Sc. . . Pleasant St., North Amherst
Assistant Professor of Agriculture

S. Francis Howard, M.Sc. . . . 66 Pleasant St.
Assistant Professor of Chemistry

Robert W. Lyman, LL.B. . . . Northampton
Lecturer on Farm Law

Louis R. Herrick, B.Sc. . . . 84 Pleasant St.
Instructor in French and Spanish

Henry James Franklin, B.Sc. . . 96 Pleasant St.
Instructor in Botany

George O. Greene, M.Sc. . . . 75 Pleasant St.
Instructor in Horticulture

Francis Canning . . . . . Mount Pleasant
Instructor in Floriculture

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Instructor in Chemistry

Alfred Akerman, M.F. . . . .
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E. Frances Hall . . . Leverett St., North Amherst
Librarian

Richard S. Lull, M.Sc., Ph.D. . . 14 Maple Ave.
Registrar

Edwin H. Forristall . . . . M. A. C.
Superintendent of Farm

Newton Wallace . . . . . 6 Phillips St.
Electrician

E. Charles Rowe . . . . M. A. C.
Steward of Dining Hall

Committees of the Faculty

Instruction: Professors Mills, Ostrander, Wellington, Hasbrouck, and the Registrar

Electives: Professors C. H. Fernald, Brooks, Paige, Hasbrouck, and Babson

Athletics: Professors Brooks, Paige, Anderson, and Howard

Catalogue: Professors Walker and Babson, Mr. Herrick, and the Registrar

Entrance Examinations: Professors Hasbrouck, Lull, and Babson

Rules: Professors Walker, Lull, and Howard

Graduate Courses: Professors C. H. Fernald, Wellington, Stone, and H. T. Fernald

Schedule: Professors Ostrander and Hasbrouck

Dining Hall: Professors Mills and Hasbrouck

Discipline: Professors Waugh and H. T. Fernald, and Mr. Herrick

Chairmen of the meetings of the instructors of the several classes
Senior class: Professor Mills
Junior class: Professor Wellington
Sophomore class: Professor Babson
Freshman class: Mr. Herrick

Admission

Every candidate for admission must be at least sixteen years of age, and must present a testimonial of good character from the principal of the last school that he attended.

FOUR-YEARS' COURSE

Candidates for admission to the freshman class will be received on certificate, as explained below, or on examination in the following subjects:

Algebra, through quadratics. Plane geometry. English. General history, Myers' *General History*. Civil government, Mowry's *Studies in Civil Government*. Physiology, Martin's *The Human Body*, briefer course. Physical geography.

This examination may be oral or written; the standard required for passing is 65 per cent. in each subject. Knowledge of the principles of arithmetic is presupposed, although an examination in this subject is not required. Inasmuch as it is found that candidates are frequently deficient in algebra and geometry, they are urged to obtain such drill in these subjects as shall secure accuracy and readiness in the application of principles to practical examples; furthermore no student found unsatisfactory in both of these subjects will be admitted to the college.

A candidate will not be accepted in English whose work is notably deficient in point of spelling, punctuation, phraseology, or division into paragraphs. The candidate will be required to present evidence of a general knowledge of the subject-matter of the books named below, and to answer questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to test the candidate's power of clear and accurate expression, and will imply only a general knowledge of the substance of the books. The books assigned for the examination in 1905 are: Shakespeare's *The Merchant of Venice*; Goldsmith's *The Vicar of Wakefield*; Scott's *Ivanhoe*; Tennyson's *The Princess*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*.

For the examination in 1906 and 1907 the books are: Shakespeare's *The Merchant of Venice*; Irving's *Life of Goldsmith*; Scott's *Ivanhoe* and *The Lady of the Lake*; Tennyson's *The Princess*; Carlyle's *Essay on Burns*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*.

TIME, PLACES, AND ORDER OF EXAMINATIONS

The regular examinations for admission in 1905 will be held in the Botanic Museum of the Agricultural College, in Amherst, on Thursday and Friday, June 22 and 23, and on Tuesday and Wednesday, September 19 and 20, as follows:

First day:	8-30 A. M.	Registration
	9-00 A. M.	English
	11-00 A. M.	General history
	2-00 P. M.	Geometry
Second day:	9-00 A. M.	Civil government
	10-00 A. M.	Algebra
	2-00 P. M.	Physiology
	3-00 P. M.	Physical geography.

Entrance examinations in June will be held on the same days and in the same order as in Amherst, at Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; at Horticultural Hall, Worcester, and at Pittsfield. Candidates desiring to be admitted to college at times other than the beginning of the year, may be examined at the convenience of the officer in charge, but not during the summer vacation.

Preliminary examinations in one or more of the required subjects may be taken a year before the candidate expects to enter college, and credit for successful examination in any subject will stand for two years after the examination.

ADMISSION ON CERTIFICATE

Certificates of schools and academies approved by the faculty of the college are accepted in place of examinations. These certificates must be made out on blanks furnished to the principal only, on application to the registrar, and must be signed by the principal of the school. Students entering on certificate may offer physics or chemistry in place of physiology or physical geography.

A student admitted on certificate may be dropped from college at any time during freshman year, when his work is not satisfactory; and the privilege implied in the acceptance of a certificate may be revoked whenever, in the judgment of the faculty, the student, either through lack of ability or of application, fails to attain the standard required.

ADMISSION TO ADVANCED STANDING

Candidates for classes more advanced than the freshman class will be examined in the studies which have been pursued by the class to which they desire admission.

Courses of Instruction

FOR THE DEGREE OF BACHELOR OF SCIENCE

AGRICULTURE

Freshman year, first semester, three hours a week, required.

Introductory. Relations of federal and state governments to agriculture, four lectures. History of agriculture, tenure of land, rents, holdings, etc., six lectures.

Animal breeding. Shaw's *Breeding Animals*, lectures and discussion of principles of breeding. Assistant Professor COOLEY

Sophomore year, seven weeks, first semester, four exercises a week in class room, required. Breeds of farm live stock; sheep, cattle. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.* Assistant Professor COOLEY

Sophomore year, nine weeks, first semester, four exercises a week in class room, required. Horses and swine. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep, and Swine.*
Assistant Professor COOLEY

Sophomore year, eight weeks, second semester, three hours a week, required. Dairying. Lectures on dairy farming, milk production, handling and marketing of milk, milk preservation and modification, and products of milk. Text-book, Wing's *Milk and Its Products.* Assistant Professor COOLEY

Sophomore year, ten weeks, second semester, required. Soils; formation, classification, composition; physical and chemical characteristics, and their relations to maintenance and increase in productiveness. Brooks' *Agriculture*, Vol. I, supplemented by lectures and laboratory work. Professor BROOKS

Junior year, ten weeks, first semester, elective. Methods of soil improvement, including tillage, drainage, and irrigation. Brooks' *Agriculture*, Vol. I, supplemented by lectures, laboratory work, and practical exercises. Professor BROOKS

Junior year, four weeks, first semester, elective. Manures; production, composition, properties, adaptation and use. Brooks's *Agriculture*, Vol. II, supplemented by lectures and practical exercises. Professor BROOKS

Junior year, four weeks, first semester, elective. Stock judging. Assistant Professor COOLEY

Junior year, second semester, elective. Fertilizers, including a critical study of their production, composition, properties, adaptation and use; and green manuring. Brooks' *Agriculture*, Vol. II, supplemented by lectures, laboratory work and practical exercises. Professor BROOKS

Senior year, four weeks, first semester, four hours a week, elective. Silos and ensilage; historical development; the merits and methods of construction of the different kinds of silos; the crops suited for ensilage; ensilage machinery; the methods of filling the silo; and the nature and extent of the changes taking place in ensilage as affecting food value. Lectures, books of reference, and practical exercises.

Professor BROOKS

Senior year, seven weeks, first semester, four hours a week, elective. Feeding animals; principles of digestion and animal nutrition, a study of feeding stuffs (coarse and concentrated). The relation of food to product; compounding rations. Armsby's *Cattle Feeding*, lectures and discussion.

Assistant Professor COOLEY

Senior year, seven weeks, first semester, four hours a week,

elective. Dairying: selection and management of the dairy farm, dairy cattle, chemical and physical properties of milk, etc., cream, butter, cheese, and by-products.
Assistant Professor COOLEY

Senior year, first and second semester, two exercises a week, for ten weeks. Dairy practice; use of separators, Babcock tester, butter making, etc. SPECIALISTS

Senior year, second semester, elective. The crops of the farm and crop rotation; including a study of the origin and agricultural botany of all the leading crops of the farm: annual forage crops, grasses and legumes, cereals, root-crops, vegetables, tobacco, and other special commercial crops. The production and use of each; the varieties and methods of improvement; the adaptation to soil; the special manurial requirements; and the methods of raising and harvesting are considered. Lectures, reference books, and field work.
Professor BROOKS

Senior year, second semester, elective. Agricultural experimentation: objects, methods, sources of error; interpretation of results. Lectures and study of reports, bulletins, etc.
Professor BROOKS

Senior year, second semester, elective. Farm management: selection of the farm, its subdivisions and equipment, buildings, fences, roads, water supply; farm capital, permanent, perishable, and floating. The labor of the farm and its management; farm power and farm machinery. Lectures and practical exercises. Professor BROOKS

Seminar courses, by arrangement, for advanced students.

Special problems requiring experiment or other research investigation will be assigned to students fitted for and desiring such work.

Training and practice in the use of farm implements and machines by arrangement when desired.

HORTICULTURE

This department endeavors to give the student a working knowledge of horticulture on its practical and on its scientific side. The attempt is made to inculcate a taste and an enthusiasm for horticultural pursuits, in place of distaste and dislike for the drudgery of farm life. On these things success and further progress chiefly depend.

The courses now offered are as follows, though others will be added as occasion requires:

1. *Sophomore class*, second semester. The fundamental operations of horticulture—propagation, pruning and cultivation—as related to the physiology of the plant. During the first half of this course Bailey's *Nursery Book* is used as a text. Mr. GREENE

2. *Junior year*, first and second semesters. Pomology. This course covers the three natural divisions of the subject, viz.: (a) systematic pomology, or the study of the fruits themselves, (b) practical pomology, or the practice of fruit growing, (c), commercial pomology, or the principles underlying the marketing of fruits. The course is pursued by means of text-book, lectures, laboratory, and field exercises. Mr. GREENE

3. *Junior year*, first semester, four periods weekly. Market gardening, including vegetables and small fruits. Locations, soils, methods of cultivation and marketing. Text-book Bailey's *Principles of Vegetable Gardening*, lectures, and field exercises. Professor WAUGH

4. Individual problems will be assigned to seniors who elect horticulture. This gives the student an opportunity for

specialization in various lines of fruit growing, vegetable culture, greenhouse management, landscape gardening, etc.

Professor WAUGH, Mr. GREENE, and Mr. CANNING

A seminar, made up of all students electing advanced work in horticulture or landscape gardening, meets at regular intervals for the discussion of any matters pertaining to the subject. Successful and noted horticulturists from outside the college are frequently present at these meetings to speak on the topics with which they are especially identified.

LANDSCAPE GARDENING

The college wishes to promote the work in landscape gardening in every way possible. The aim of the courses is to give the general student an understanding of the fundamental principles of design and of good taste as applied to gardening; and to prepare advanced students for the practice of landscape gardening in its various branches.

Although a variety of other work along related lines is available, the courses now definitely offered are as follows:

1. *Junior year*, four periods weekly. Materials. This course is designed to give the student an intimate acquaintance with the trees, shrubs, and other plants used in landscape gardening. Professor WAUGH and Mr. CANNING

2. *Junior year*, second semester, four hours a week. Elements of landscape design. The fundamental principles underlying the artistic development of parks, estates, gardens, and other areas, together with some of the simpler applications to practical conditions. During the first half of the term Waugh's *Landscape Gardening* will be used as a text.

Professor WAUGH

3. *Senior year*, first and second semesters, four laboratory

periods weekly. Advanced landscape gardening. Lectures, conferences, field exercises, and extensive practice work with criticism. The student is given definite problems to solve, these problems being arranged in such an order as to develop the subject logically in the student's mind.

Professor Waugh and Mr. Canning

FORESTRY

The act passed by the last General Court establishing the office of state forester directed that one of the duties of this officer should be to give annually a course of lectures on forestry at the Massachusetts Agricultural college. This course will be given for the first time during the spring semester, 1905. It will consist of lectures on the general principles of forestry, the formation, regeneration, and exploitation of forests, etc., but will give special attention to farm forestry or the management of small wood lots. The lectures will be accompanied by a number of field exercises in the college wood lot and in nearby forests. The whole will be under direct charge of the State Forester Mr. Alfred Akerman, a graduate of the Yale Forestry School, in direct co-operation with the Horticultural department of the college.

CHEMISTRY

This course aims to inculcate accurate observation, logical thinking, systematic and constant industry, together with a comprehensive knowledge of the subject. Instruction is given by text-book, lectures, and a large amount of laboratory work under adequate supervision. The laboratory work at first consists of a study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by a quantitative analysis of salts, minerals, soils, fertilizers, animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest, such as the production of sugar, starch, and dairy products; the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders and foods; and the analysis of soils, waters, milk, wine, and other animal and vegetable products.

The courses are as follows:

Freshman year, second half of second semester, four hours a week. General chemistry, part 1, principles of chemistry, non-metals. Newth's *Inorganic Chemistry.*

Assistant Professor HOWARD

Sophomore year, first semester, six hours a week. General chemistry, part 2, metals. Assistant Professor HOWARD

Second semester, five hours a week. Subject continued, dry analysis. Assistant Professor HOWARD

Junior year, first semester, eight hours a week. Qualitative and quantitative analysis, organic chemistry. Four hours a week; special subject. Professor WELLINGTON

Second semester, ten hours a week. Organic chemistry. Remsen's *Organic Chemistry.* Five hours a week; special subject. Professor WELLINGTON

Senior year, first semester, three hours a week. Chemical industries. Professor GOESSMANN

Eight hours per week; quantitative analysis and physical chemistry, Reychler-McCrae's *Physical Chemistry.*

Professor WELLINGTON and Assistant Professor HOWARD

Second semester, eight hours a week. Advanced work with lectures.

Professor WELLINGTON

GEOLOGY

1. Mineralogy, *Junior year*, first semester, six weeks, three hours a week. A course of systematic determinative mineralogy based on Brush's *Manual*. This work is carried on in the laboratory and consists in determining the minerals by a study of lustre, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests.

Assistant Professor Howard

2. Geology, *Junior year*, second semester, twelve weeks, three hours a week. Structural, dynamical, physiographical, and historical, based upon Scott's *Introduction to Geology*. The course aims to give a review of the physical condition of the earth; the various dynamic agencies and the results of their activities; the origin and the structure of rocks; and finally, the geological history of the globe and the appearance in time and the development of the principal races of animals and plants.

The museum, lantern slides, and the classic Connecticut Valley afford ample means for illustration. Professor Lull

ZOÖLOGY

1. Anatomy and physiology, *Freshman year*, one-half of the second semester, four hours a week. A text-book, Martin's *The Human Body*, advanced course, is used, in which daily recitations are assigned, supplemented by demonstrations from the charts and models and from microscopic and other preparations. The fact that the subject is required for entrance makes it possible in a comparatively brief period to review the main features of human anatomy, the generally accepted views concerning the physiology of the various organs, and the more essential laws of health; and, aside from the practical value of

the last, the knowledge of the human system thus gained aids greatly to the zoölogical work to come. Professor LULL

2. Zoölogy, *Sophomore year*, first semester, two periods a week. This is mainly a laboratory course, the aim being to familiarize the student with the structure of a number of typical forms, representative of the chief phyla of the animal kingdom, to train him to more precise habits of observation, and to lay the foundation for a more thorough understanding of laboratory technique. Lectures, amply illustrated by specimens, charts, and lantern slides, supplement and render orderly the knowledge gained in the laboratory. Professor LULL.

3. Zoölogy. *Junior year*, four periods a week. A course in comparative morphology and systematic zoölogy based upon Parker and Haswell's *Text-book of Zoölogy*. Opportunity is given for the careful dissection of each of the typical forms, or its equivalent, described in the text, with a further series of animals for comparative study. Special attention is paid to individual and racial development, adaptation, relationship of animals to one another and to plants, geological and geographical distribution of animals, and the economic importance of the different groups, except the insects, both living and extinct. The lectures are illustrated by the very complete museum collection. Professor LULL

POLITICAL SCIENCE

The purpose of the entire course is to fit the student to understand the economic and political movements of his time, so that he may successfully solve the problems confronting him.

Economics, *Junior year*, first semester, four hours a week. The elements of political economy are taught by means of text-book, Henry Rogers Seager's *Introduction to Economics*, and lectures, the aim being to make the student familiar with the generally accepted facts, definitions, principles, and laws of the science; and to train him to criticise theories, scrutinize facts, and weigh arguments. Papers giving the results of research, prepared by members of the class are read and discussed. Professor WALKER

Constitution of the United States, *Senior year*, four hours a week during the last half of the first semester and the whole of the second semester. By use of text-book, Albert Bushnell Hart's *Actual Government*, and lectures, the student is led to understand what is the government, municipal, state, and federal, now existing in the United States. This government is compared and contrasted with the governments of England, France, and Germany. Care is taken to familiarize the student with the practical methods of legislation, of nominating conventions, of elections, and of administration. The origin, nature, scope, and purpose of government are discussed. Woodrow Wilson's *The State*, and Bancroft's *History of the Constitution of the United States* are used as books of reference. Professor WALKER

Lectures on law, *Senior year*, second semester, one hour a week. This course treats of laws relating to business, especially to business connected with rural affairs, citizenship, domestic relations, farming contracts, riparian rights, real estate, and common forms of conveyance. Practical work is required such as may fit one to perform the duties of a justice of the peace. Mr. LYMAN

ENGLISH

This department aims to secure: (a) ability to give written and oral expression of thought in correct, effective English; (b) acquaintance with the masterpieces of American and English literature; (c) ability to present, logically and forcibly, oral and written arguments on propositions assigned for debate.

The following courses are offered: under (a) rhetoric and oratory; under (b) American literature and English literature; under (c) argumentation. The elective course in senior year is in language and literature.

1. Rhetoric. This course extends through the two semesters of freshman year, and through the second semester of sophomore year. In the first semester of freshman year, work is confined to essay writing and to personal criticism, by the instructor, of the students' compositions. This criticism is offered to each student individually. At stated intervals during the semester necessary information with regard to the preparation of essays is furnished each student. In the second semester of freshman year, the study of literary types is undertaken in the form of class-room work in prose composition, including exposition, persuasion, narration, description, and in prose diction, including usage and style. Special attention is given to the training of the inventive ability of the student. The textbook used is Baldwin's *College Manual of Rhetoric.* In the second semester of sophomore year, individual work in essay writing is again taken up, largely based upon the previous work of the class in American literature. (See 3 below.) Here also personal criticism is offered. Assistant Professor Babson

2. Oratory. Individual drill in declamation, first in private and then before the class, is given during the second semester of freshman year. The choice of speakers for the Burnham prizes is based upon this work. In the junior year, during the first semester, at least two orations, upon subjects assigned or chosen, are written, and delivered before the class. Every oration is criticised by the instructor before it is committed to memory by the student. The choice of speakers for the Flint prizes in oratory is based upon this work.

Assistant Professor Babson

3. Literature. American literature is studied in the first semester of sophomore year, four hours a week. The course comprises, first, the careful study of a text-book, Newcomer's *American Literature*, together with recitations based upon the same; secondly, the taking of notes from lectures, dwelling upon topics not fully treated in the text-book; and thirdly, the reading outside of the class-room of assigned selections from the prose and poetical works of standard American authors.

Assistant Professor BABSON

The history of English Literature is studied during the second semester of sophomore year, four hours a week. The work is based upon a text-book, this year Johnson's *History of English and American Literature.* The topical method is followed in recitation, and instead of formal lectures, there are discussions of points requiring a fuller development than the text-book gives. Collateral readings of literature are required. Frequent written tests are given in which particular attention is given to (a) the definition of words used in the text-book; (b) the use of English in the development of the topics unfolded in the text-book or discussed in the class-room.

Professor MILLS

4. Argumentation. Four hours a week during the first semester of junior year are given to written and oral argumentation. The course is outlined as follows; (a) principles of argumentation as laid down in a text-book or by lecture; (b) briefs and brief-making; (c) briefs developed into forensics and submitted for personal criticism; (d) debates.

Professor MILLS

Senior elective course, two semesters, four hours a week. The work in this course is upon the following subjects: (a) English language, its origin, history, and development, with particular attention to the study of words as outlined in Anderson's *A Study of English Words*; (b) English literature, principally of the eighteenth and the nineteenth centuries.

Professor MILLS

VETERINARY SCIENCE

The course of instruction in veterinary science has been arranged to meet the demands of the students, who, after graduation, purpose following some line of work in practical agriculture. Particular stress is laid upon matters relating to the prevention of disease in animals. In addition, the interests of prospective students of human and comparative medicine have been taken into account in the arrangement of the course of study. The subject is taught by lectures, laboratory exercises, demonstration, and clinics.

Senior year, (elective), first semester, four hours a week. Veterinary hygiene, comparative (veterinary) anatomy, general pathology. Professor PAIGE

Second semester, four hour a week. Veterinary materia medica and therapeutics; theory and practice of veterinary medicine; general, special, and operative surgery; veterinary bacteriology and parasitology; medical and surgical clinics.

Professor PAIGE

The instruction in bacteriology is given by means of lectures, recitations, and laboratory exercises. The object of this course of study is to acquaint the student with the various organisms found in air, water, soil, milk, and the body, and their relation to such processes as decomposition, fermentation, digestion, and production of disease. The toxic substances resulting from the growth of organisms are considered, as well as the antitoxines used to counteract their action.

Senior year, first half of the first semester, four laboratory exercises of two hours each a week. Required.

Professor PAIGE

BOTANY

The object of the course in Botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. The undergraduate work extends through six semesters. The first two semesters are required. An outline of the course follows:

Freshman year, first semester, five hours a week. Laboratory work and lectures. Histology and physiology of the higher plants. This includes a study of the minute structure of the plant organism, such as stems, roots, leaves, seeds, etc., together with their function and their chemical and physical properties. This course extends into the next semester.

Mr. FRANKLIN

Freshman year, second semester, three hours a week. Laboratory work, lectures, and text-book. Outlines of classification and morphology of the higher plants. This course follows the preceding one, and commences about the first of March. It is devoted to a study of the relationship of plants, their gross structure, together with extensive individual practice in flower analysis. An herbarium of 200 species of plants is required.

Mr. FRANKLIN

Junior year, first semester, five hours a week, two laboratory exercises and one lecture period a week. Cryptogamic botany. This includes a study of the lower forms of plant life necessary for a comprehension of the following courses.

Mr. FRANKLIN

Junior year, second semester, five hours a week, two laboratory exercises and one lecture period a week. Elements of vegetable pathology and physiology. This course includes a study of the common fungus diseases of crops, and consideration of the method of prevention and control of the same.

The plant's function as related to susceptibility to disease is also taken up. All of the junior botany is included in four of the junior elective courses. Professor STONE

Senior year, (elective), both semesters, three laboratory exercises and one lecture period a week. (a) Plant physiology. (b) Plant pathology. Either course is optional. This course is adapted to students who desire a more detailed knowledge of plant diseases and plant physiology. Extensive use is made of the valuable and constantly increasing experiment station literature. Professor STONE

MATHEMATICS, PHYSICS, AND ENGINEERING

This department has charge of the instruction in mathematics, physics, civil engineering, and drawing. The aim is to secure thorough work in the fundamental principles and train the mind in clear and logical thinking. The application of the subjects to practical problems is given special attention. The work of the department extends over the four years as outlined below.

MATHEMATICS

Freshman year, first semester, five hours a week. Higher algebra, including ratio and proportion, progressive binomial theorem, series undetermined coefficients, logarithms, continued fractions, permutations. Wells' *College Algebra.*

Professor HASBROUCK

Second semester, two hours a week. Solid geometry. Wells' *Solid Geometry.* Professor HASBROUCK

Plane trigonometry, two hours a week. Phillips and Strong's *Elements of Trigonometry.* Professor OSTRANDER

Junior year, for mathematical and chemical students, first semester, four hours a week. Analytic geometry of the line, circle, conic sections, and higher plane curves. Nichols' *Analytic Geometry.* Professor OSTRANDER

Second semester, four hours a week. Differential and integral calculus. Osborne's *Calculus.* Professor HASBROUCK

PHYSICS

Sophomore year, first semester, four hours a week. Elementary mechanics of solids, liquids and gases, heat, and sound. Dana's *Elementary Mechanics*, Carhart's *University Physics.* Professor HASBROUCK

Second semester, four hours a week. Electricity, magnetism, and light. Carhart's *University Physics.* Professor HASBROUCK

Senior year, elective for those students who have taken junior mathematics; first semester, four hours a week. Analytic mechanics. Peck's *Analytic Mechanics.* Professor HASBROUCK

Second semester, four hours a week. Laboratory work. Professor HASBROUCK

CIVIL ENGINEERING AND SURVEYING

Sophomore year, second semester, two exercises of two hours a week. Plain surveying with field work, including the use of the usual surveying instruments. Barton's *Surveying.* Professor OSTRANDER

Instruction in Civil Engineering will be given in two distinct courses of one year each, the courses alternating. They will be open to students of the junior and senior classes as indicated below. The course for 1904-5 will be for students in mathematics only. First semester, three hours recitation and two hours draughting a week; stresses in roofs, bridges and graphic statics. Merriman and Jacoby's *Roofs and Bridges*, Parts I and II.

Second semester, four hours a week. Hydraulics and sanitary engineering. Merriman's *Hydraulics and lectures*.

Professor OSTRANDER

The course for 1905-6 will be required of juniors and seniors taking the courses in mathematics and landscape gardening.

First semester, four hours a week. Strength of materials, foundations and masonry construction. Text-book and lectures.

Professor OSTRANDER

Second semester, three hours recitation or lectures and two hours field work or draughting a week. Topographic and higher surveying, highway construction, the measurement of earth work, pavements and railroad construction. Text-book and lectures. Professor OSTRANDER

DRAWING

Junior year, first semester, two two-hour sessions a week for students in mathematics, and landscape gardening; free hand drawing.

Second semester, two two-hour sessions a week. Mechanical and topographic drawing.

ENTOMOLOGY

The importance of a knowledge of insects in every department of life is recognized by placing an introductory course in this subject as a required study in the junior elective courses—(1) agriculture, (2) horticulture, (3) biology, (4) landscape gardening. For those who desire a further knowledge of it, because of its importance to their future occupations, a senior elective is offered, so shaped as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry, or science teaching, as life occupations.

Junior year, second semester, four exercises a week, of two hours each. Lectures, laboratory, and field work; general consideration of insect structure and life histories; systematic study of the groups of insects with particular reference to those of economic importance; methods for preventing or checking their ravages; insecticides and apparatus for their use; the collecting, mounting, and naming of insects, and examination of the work of insects in the field and laboratory.

Professor H. T. FERNALD

Senior year, (elective), first and second semesters, four laboratory exercises of two hours each a week. Lectures, laboratory and field work; advanced morphology of insects; economic entomology; training in the determination of insects; use of literature on entomology; study of life histories; value and application of insecticides; thesis on insects most closely related to future occupation of the student.

Professors C. H. FERNALD and H. T. FERNALD

MODERN LANGUAGES

FRENCH.—Course I. Required for the two semesters of the freshman year, four hours a week, first semester; four hours a week, second semester. The aim of this course is to enable the student to read modern French fluently, especially that found in scientific journals and treatises. The first ten weeks are devoted to gaining a thorough mastery of the accent and such principles of grammar and syntax as are covered by the first half of Whitney's *French Grammar*. Great stress is laid upon the acquisition of a correct accent, a good vocabulary, and a thorough comprehension of the main idiomatic difficulties of the language. This course is further strengthened by constant drill in pronunciation, exercises, and composition.

Mr. HERRICK

Course II. Elective for both semesters of the senior year, four hours a week. The aim of this course is to equip the student with a general knowledge of classical literature, and a working knowledge of the language as it is spoken and written in the French capital today. Drill is furnished in composition, principles of syntax, and sight translation. Students electing Course II must have a good record in Course I or must pass a satisfactory examination therein. Mr. HERRICK

SPANISH.—Elective for both semesters, four hours a week. The special aim is to enable students planning future fields of work in Spanish speaking countries to acquire sufficient speaking and writing knowledge of the Castilian dialect to enable them to start to best advantage. Especial attention is given to conversation, the method employed being that found in Marion and Garennes' *Introductión á la Lengua Castellana*. Grammar rudiments, accent, and idiomatic difficulties are thoroughly studied ; the acquisition of a good working vocabulary is insisted upon, and the course is further strengthened by practice in writing from dictation, constant drill in pronunciation, exercises and composition, and the reading of books characteristic of modern Spanish life and customs.

Mr. HERRICK

GERMAN.—Course I. Required for both semesters of sophomore year, four hours a week, first semester; three hours a week, second semester. An understanding of the rudiments of grammar, facility in translation, and an ability to pronounce the language and to understand simple spoken German are the main objects in view. Assistant Professor BABSON

Course II. Elective for both semesters of senior year, four hours a week. Special attention is given to the reading of German, particularly to German of a scientific nature. Work is also required in prose composition throughout the year. Accuracy in pronunciation, the ability to understand German as spoken in the class room, and to converse within reasonable limits are also features of this course. Students electing Course II must have a good record in Course I, or must pass a satisfactory examination therein. Assistant Professor BABSON

MILITARY SCIENCE

In compliance with the provisions of an act of Congress, of July 2, 1862, military instruction under a regular army officer, detailed for this purpose, is required of all able-bodied male students. Men are excused from attendance upon the exercises of this department only on a surgeon's certificate, given by Dr. Charles F. Branch, the college physician.

The object of such instruction is clearly to disseminate the elements of military knowledge throughout the country, that, in case of sudden emergency, a sufficient number of well-trained, educated men may be found to command and properly to instruct volunteer troops. Military drill also has the object in view of giving the student physical exercise, teaching respect and obedience to those in authority, without detracting from pride of manhood, and developing a military bearing and courtesy becoming in a citizen as in a soldier.

In order further to stimulate the study of military science in colleges, the War Department issued General Orders No. 6, dated Washington, D. C., Aug. 24, 1903, as follows:

The reports of the regular inspections of the colleges and schools to which officers of the army are detailed, in pursuance of law, as principals or instructors, will annually hereafter be submitted to the General Staff for its critical examination, and the chief of staff will report to the Secretary of War, from the institutions which have maintained a high standard, the six institutions whose students have exhibited the greatest interest, application, and proficiency in military training and knowledge. The President authorizes the announcement that an appointment as second lieutenant in the Regular Army will be awarded to an honor graduate of each one of the six institutions, provided sufficient vacancies exist after caring for the graduates of the Military Academy at West Point and the successful competitors in the annual examination of enlisted men. * * * * *

By order of the Acting Secretary of War.
Signed S. B. M. YOUNG,
Lieutenant General, Chief of Staff.

Course I. Out of doors, an exercise of one hour, three times a week, Mondays, Tuesdays, and Thursdays; infantry drill by squad, company, and battalion; guard mounting, dress parade, inspection, and review; artillery drill by detachment; target practice. A guard is mounted four times in each week and the guard maintained under practical instruction for one hour in each exercise.

All drills are in the drill hall during the winter months and inclement weather.

Students assigned to the college band are given instruction and practice in band music and band evolutions, in place of drills and recitations.

Course II. Theoretical instruction for freshmen, one hour a week for both semesters, comprises recitations in infantry drill regulations. *United States Service Manuals.*

Course III. Theoretical instruction for seniors for both semesters, one hour a week, embraces drill and army regulations; duties of sentinels and guard duty; elements of military science; preparation of necessary reports and returns pertaining to a company of infantry ; and a thesis on some military subject. Wagner's *Elements of Military Science*.

Major ANDERSON

SYNOPSIS OF THE COURSES OF INSTRUCTION

The figures indicate the number of exercises a week; light faced type, recitation periods of one hour each ; heavy faced type, laboratory periods of two hours each.

FRESHMAN YEAR

First Semester

Language	English	3
	French	4
Mathematics	Algebra	5
Science	Agriculture	4
	Botany **2**+1	3
Military	Tactics	1
History		2
		—22

Second Semester

Language	English	4
	French	4
Mathematics	Geometry and trigonometry	4
Science	Anatomy and physiology half semester Chemistry half semester	4
	Botany **1**+1	2
History		2
		—20

SOPHOMORE YEAR

First Semester

Language	English	4
	German	4
Physics		4
Science	Agriculture	4
	Chemistry	**3**
	Zoölogy **1**+1	2
		—21

Second Semester

Language	English	4
	German	3
Physics		4
Surveying		2
Science	Agriculture 2+1	3
	Chemistry	2½
	Horticulture	3
		—21½

JUNIOR YEAR

First Semester

Course in Agriculture	Agriculture 3+1	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	Horticulture	3
	English	4
		—20
Course in Horticulture	Horticulture	4
	Horticulture 1+3	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	English	4
		—21
Course in Biology	Zoölogy 3+1	4
	Botany 2+1	3
	Chemistry	3
	Geology	3
	Horticulture	3
	English	4
		—20
Course in Chemistry	Chemistry	4
	Agriculture 3+1	4
	Mathematics	4
	Geology	3
	English	4
	Special subject	2
		—21
Course in Mathematics	Analytical geometry	4
	Engineering 1+3	4
	Free hand drawing	2
	Landscape gardening	4
	Geology	3
	English	4
		—21

Course in Landscape Gardening	Landscape gardening	4
	Agriculture 2+1	3
	Botany 2+1	3
	Free hand drawing	2
	Horticulture	3
	Geology	3
	English	4
		—22

Second Semester

Course in Agriculture	Agriculture 2+1	3
	Botany 2+1	3
	Chemistry	4
	Horticulture	2
	Entomology	4
	Economics	4
		—20
Course in Horticulture	Horticulture	4
	Botany 2+1	3
	Chemistry	4
	Landscape gardening	2
	Entomology	4
	Economics	4
		—21
Course in Biology	Entomology	4
	Zoölogy	3
	Botany 2+1	3
	Chemistry	4
	Horticulture	2
	Economics	4
		—20
Course in Chemistry	Chemistry	5
	Agriculture 2+1	3
	Mathematics	4
	Economics	4
	Special subject	5
		—21
Course in Mathematics	Engineering	5
	Mathematics	4
	Mechanical drawing	2
	Landscape gardening	4
	Economics	4
		—19
Course in Landscape Gardening	Landscape gardening	4
	Botany 2+1	3
	Mechanical Drawing	2
	Engineering	5
	Entomology	4
	Economics	4
		—22

SENIOR YEAR

First Semester

The following subjects are required in all courses :

Bacteriology, half semester **4** Constitution of the United States, half semester 4	4
Military science	1
	—5

Second Semester

Constitution of the United States	4
Military science	1

From the following, the student must elect three courses, closely correlated with his junior year course. Only one course in language can be elected.

Agriculture	4	Entomology **3+1**	4	English	4
Horticulture **3+1**	4	Chemistry **3+1**	4	French	4
Veterinary	4	Physics	4	German	4
Botany **3+1**	4	Engineering	4	Spanish	4
Landscape gardening	4			Latin	4

Courses of Instruction

FOR THE DEGREES OF MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY

Applicants are not eligible to the degree of Master of Science or of Doctor of Philosophy until they have received the degree of Bachelor of Science or its equivalent.

COURSES FOR THE DEGREE OF MASTER OF SCIENCE

A course of study is offered in each of the following subjects: mathematics and physics, chemistry, agriculture, botany, horticulture, entomology, veterinary science. Upon the satisfactory completion of any two of these, the applicant receives the degree of Master of Science.

Candidates for the degree of Master of Science must devote not less than one year and a half after graduation to the prosecution of two studies for the degree, one year of which must be in residence at the Massachusetts Agricultural College.

COURSES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is conferred upon candidates who shall have spent three years of graduate work in this institution and satisfactorily completed a major subject and two minor subjects. Botany, chemistry, entomology, or horticulture may be selected as the major. The minors available are botany, chemistry, entomology, horticulture, and zoölogy.

At least three years is necessary to complete the work required: twenty hours a week to be devoted to the major subject, and from twelve to sixteen to be given to each minor during one and a half years.

A general outline of the work assigned for the major study in each subject is as follows :

BOTANY. Vegetable physiology, vegetable pathology, mycology, œcology, taxonomy, phylogeny, the history of botany, and the history and theory of evolution. The above subdivisions of botany will be, to a greater or less extent, pursued as necessitated by the previous training of the student and the nature of the original problem undertaken. In this course it is also recommended that the student take, in addition to this prescribed minor work, a brief course in the history of philosophy and psychology, which at present will have to be provided elsewhere. Extensive reading of botanical literature, of both a general and a specific nature, will be required in certain subjects, and occasional lectures will be given. A botanical conference is held monthly wherein various new problems touching upon botanical science are considered by graduate students and those of the senior class electing botany. A thesis dealing with some economic problem in plant physiology, or pathology, or both, and containing a distinct contribution to knowledge, will also be required.

CHEMISTRY. Advanced work in the following subjects : inorganic analysis, qualitative, of the rarer elements, and quantitative ; crystallography ; physical chemistry ; descriptive and determinative mineralogy ; chemical geology ; soil formation ; soil physics and chemistry ; gas analysis ; synthetic inorganic work ; chemical theory and history ; general organic chemistry ; special topics in organic chemistry ; elementary quantitative organic analysis ; proximate qualitative and quantitative organic analysis, including determination of organic radicles ; organic synthesis of aliphatic and aromatic compounds ; problems in chemical manufacture; recent chemistry of plant nutrition; animal physiological and pathological chemistry, including foods, standards for feeding of all kinds, and among secretions, milk and milk industries, and among excretions, urine and urinalysis; toxicology; insecticides and fungicides; frequent examinations on current chemical literature.

Early in the course original work on some chemical subject pertaining to agriculture must be begun. The history and results of this work must be submitted before graduation in the form of a thesis containing a distinct contribution to knowledge.

ENTOMOLOGY. *General morphology of insects*: embryology; life history and transformations; histology; phylogeny and relation to other arthropods; hermaphroditism; hybrids; parthenogensis; pædogensis; heterogamy; chemistry of colors in insects; luminosity; deformities of insects; variation; duration of life.

Œcology: dimorphism; polymorphism; warning coloration; mimicry; insect architecture; fertilization of plants by insects; instincts of insects; insect products of value to man; geographical distribution in the different faunal regions; methods of distribution; insect migrations; geological history of insects; insects as disseminators of disease; enemies of insects, vegetable and animal, including parasitism.

Economic entomology: general principles; insecticides; apparatus; special cases; photography of insects and their work; methods of drawing for illustrations; field work on insects and study of life histories; insect legislation.

Systematic entomology: history of entomology, including classifications and the principles of classification; laws governing nomenclature; literature,—how to find and use it; indexing literature; number of insects in collections and existence (estimated); lives of prominent entomologists; methods of collecting, preparing, preserving, and shipping insects; important collections of insects.

Journal club: assignments of the literature on the different groups of insects to different students who report at monthly meetings summaries of all articles of value which have appeared during the month.

Required readings of the best articles on the various topics named above and on the different orders of insects. This reading covers from 15,000 to 20,000 pages in English, French, and German, and the candidate is examined on this together with his other work at the close of his course.

Thesis: A thesis with drawings, which shall consist of the results of original investigation along one or several lines, and which shall constitute a distinct contribution to knowledge, must be completed and accepted before the final examinations are taken.

HORTICULTURE. The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation, and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself continuously to it. He will be required to attend lectures, conferences, and seminars, dealing with horticulture in its broader aspects. Advanced work will be required in the following subjects: systematic pomology, pomological practice, commercial pomology; systematic, practical, and commercial olericulture; greenhouse plants and problems; floriculture; landscape gardening; plant breeding and general evolution; and questions of a physiological nature connected with propagation and pruning.

Other requirements and opportunities are (1) periodical seminars with special lectures by prominent men from outside the college; (2) extensive and systematically planned readings; (3) frequent visits to orchards, gardens, greenhouses, estates, and libraries outside the college grounds, always with some definite purpose in view; (4) and finally, the preparation, and publication of a thesis setting forth the results of the candidate's major study, which shall be an original and positive contribution to horticultural knowledge.

ZOÖLOGY. This course is offered as a minor subject for candidates for the degree of Doctor of Philosophy.

General and comparative anatomy, both gross and microscopic; ontogeny and phylogeny; life cycles, metamorphosis and metagenesis; animal associations, colonial, commensal, and parasitic, and symbiotic associations of animals and plants; adaptation, adaptive radiation and parallelisms.

Geologic, geographic, and bathymetric distribution of animals.

Systematic zoölogy, including palæozoölogy; museum and field technique.

Economic zoölogy.

History and development of the zoölogical science.

Weekly seminar and journal club meetings are held, in which all advanced students of zoölogy take an active part.

Collateral reading and a general knowledge of current zoölogical literature are required.

Courses of Instruction

FOR SPECIAL STUDENTS

A TWO YEARS' COURSE FOR WOMEN

Women are received who wish to pursue the studies named below. There is no charge for tuition. Board may be obtained in the Dining Hall and also rooms, so far as the accommodations will permit.

First year, first semester: soils, fertilizers, and cultivation, four hours a week; elementary botany, five hours; French, four hours; free hand drawing, four hours.

Second semester: propagation and pruning (horticulture, one hour) three hours; botany: morphology, plant analysis, five hours; chemistry, descriptive, five hours; vegetable gardening, four hours; French, four hours.

Second year, first semester: pomology, three hours a week; greenhouse construction and management, three hours; botany: structure and physiology of plants, five hours; zoölogy, two hours: chemistry, five hours; German, four hours.

Second semester: landscape gardening, three hours a week; floriculture, four hours; vegetable pathology, five hours; entomology, three hours; chemistry, five hours; German, three hours.

SHORT COURSES

These courses are open to persons of both sexes. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is required. Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

I. DAIRY FARMING

	Hours a week
Soils, tillage, and methods of soil improvement: manures and fertilizers and their use; crops and rotations	4
Breeds and breeding of dairy stock; judging to scale of points	2
Fodders and feeding farm live stock	1
Stable construction and sanitation	1
Common diseases of stock; prevention and treatment	1
Dairy products, their general characteristics, testing	2
Chemical composition of milk and of special milk products	1
Botany	2
Horticulture	3
Entomology	3
Dairy practice, including testing, use of separators, buttermaking, preparation of certified and modified milk and pasteurization	4
Practice in horticulture	1

Begins first Wednesday in January and continues ten weeks.

II. HORTICULTURE

	Hours a week
Soils, tillage, manures, etc.	4
Plant propagation and pruning	3
General fruit growing	3
Market gardening	3
Botany	4
Entomology	3
Practice work in seed testing, seeding, grafting, budding, transplanting, judging fruit, etc.	

Begins first Wednesday in January; continues ten weeks. This course will not be given unless at least eight men register for it.

III. A SHORT COURSE IN BEE CULTURE

This course begins the fourth Wednesday in May and continues two weeks, but will not be given unless applied for by at least six students.

	Total hours
The structure of bees, with special reference to their work . . Professor H. T. FERNALD	3
Flowers and fruits in their relations to bees . . . . . . Professor STONE	10
Honey crops and how to grow them . . . . Professor BROOKS	5
Bees and bee keepers' supplies . . . . Professor PAIGE	10
Work in the apiary, under direction of an expert	20
Instruction by specialists	4

Equipment of the Several Departments

AGRICULTURE

The part of the college estate, assigned to the department of agriculture contains 160 acres of improved land, 40 acres of pasture, and 16 acres of woodland. The latest inventions in improved agricultural tools and machinery are in practical use. The large and commodious barn and stables are stocked with the best breeds of horses, cattle, sheep, and swine. Attached to the barn is a dairy building equipped with the latest machinery driven by an electric motor. The museum contains a collection of implements, seeds, plants, and models of animals, all of which are designed to illustrate the evolution of agriculture. Three large lecture rooms, one in South College, and two in the dairy building have been assigned to this department.

The laboratory is provided with a full line of the latest and most highly improved apparatus for the study of the physical properties and the mechanical analysis of soils. Space for the indoor study of farm-machinery in motion is provided. A dynamometer for determination of the draft of machines and implements; surveyor's instruments for use in drainage problems; and microscopes and germination apparatus for use in seed examination are among the more important of the accessories in this department.

HORTICULTURE AND LANDSCAPE GARDENING

For illustration of the science and the practice of horticulture, the department possesses about 100 acres devoted to orchards planted with the leading old and new varieties of

apples, pears, peaches, plums, cherries, quinces, chestnuts, hickory-nuts, and walnuts; vineyards containing neary 200 named varieties of grapes, besides many seedlings, and about an acre devoted to a commercial crop of a few market varieties; nurseries containing many kinds of fruit and ornamental trees, shrubs, and plants, in all stages of growth, from the seed and cuttings to those ready for planting out; and small fruit plantations of considerable diversity and extent. Several acres of excellent garden land are devoted to the growing of all the common types of vegetables. All these plantations, as far as possible, are managed according to the best practical and commercial methods, so that students may learn to know not merely the plants themselves but the best methods of handling them at a profit.

There are large well-stocked glass houses to illustrate the principles of greenhouse construction and management. These houses contain a large collection of the economic plants of the world, and also small commercial supplies of those plants such as carnations and chrysanthemums, commonly grown for market. Vegetable growing under glass is practiced to an extent necessary for purposes of illustration.

A fine arboretum of trees and shrubs, native and exotic, furnishes material for the study of landscape gardening. Gardens of hardy and tender plants are being continually extended. Actual work in practical landscape gardening, laying drives and walks, planning and planting various areas, is constantly in progress on the college campus.

CHEMISTRY

This department has rooms well adapted to their special uses. They are supplied with a large assortment of apparatus and chemical materials. The lecture-room on the second floor has a seating capacity for seventy students. Immediately adjoining it are four smaller rooms used for storing apparatus and preparing materials for the lecture table. The laboratory for beginners is a large room on the first floor furnished with forty working tables. Each table is provided with reagents and apparatus for independent work. A well equipped laboratory for advanced work is also provided on the first floor. A weighing room has six balances and improved apparatus for determining densities of solids, liquids, and gases. The apparatus also includes a microscope, a spectroscope, a polariscope, a photometer, a barometer, and numerous models and sets of apparatus. The various rooms are furnished with an extensive collection of industrial charts. A valuable and growing collection of specimens and samples, fitted to illustrate different subjects taught, is also provided. This includes rocks, minerals, soils, raw and manufactured fertilizers, foods, including milk products, fibres, and other vegetable and animal products, and artificial preparations of mineral and organic compounds. Series of preparations are used for illustrating the various stages of different manufactures from raw materials to finished product.

GEOLOGY

Geological teaching is illustrated by a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, models, and charts.

ZOÖLOGY

Zoölogical laboratory.—A large, well-lighted room, situated in the chemical laboratory, is fitted with necessary tables, trays, and general apparatus, microscopes, dissecting instruments, hand-lenses, and the like. There have lately been added aquaria, in which, as far as possible, the various types studied may be seen in their natural environment. A reference library is kept in the laboratory.

Zoölogical lecture room.—An ample lecture room is situated in South College, adjacent to the museum. It is supplied with a set of Leuckart charts and many special ones as well, and with a complete set of Auzoux models, illustrative both of human and comparative anatomy. A special set of typical specimens is used for class illustration, although the more extensive museum collection is drawn upon for the same purpose.

Museum of zoölogy.—The museum is mainly for the purpose of exhibiting those forms treated of in the lecture and laboratory courses, but, in addition to this, the aim has been to show as fully as possible the fauna of the Commonwealth, and those types which show the evolution and the relationship of the members of the animal kingdom. The total number of specimens contained in the museum now exceeds eleven thousand. The museum is open to the public from 3-30 to 5-30 P. M., each week day.

Entomological laboratory.—The equipment for work in entomology during the senior year and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes,, microtomes, reagents, and glass ware. One portion of the building is fitted up as a lecture room. Another room is devoted to library purposes, and contains a card-catalogue of nearly fifty thousand cards, devoted to the literature of insects. In addition to a well selected list of entomological works in this room, the college library has an unusual number of rare and valuable books on this subject. This is supplemented by the private entomological libraries of the professors in charge, which contain over twenty-five hundred volumes, many of which cannot be found elsewhere in the United

States. In another room is a large and growing collection of insects, both adult and in the early stages, which is of much assistance to the students. As the laboratory is connected with the insectary of the Hatch Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray pumps, nozzles, and other articles for the practical treatment of insects ; the chemical room, fitted up for the analysis of insecticides, and other chemico-entomological work ; and a greenhouse, where plants infested by injurious insects are under continual observation and experimental treatment,—all these are available to the student. In addition, several private laboratory rooms and a photographing room with an unusually good equipment of cameras are provided. The large greenhouses, grounds, gardens, and orchards of the college are also to be mentioned under this head, providing for study, as they do, a wide range of subjects relating to the attacks of injurious insects under natural conditions.

VETERINARY SCIENCE

The department has for its sole use a commodious and modern laboratory and hospital-stable erected in 1899. Both buildings are constructed according to the latest ideas as regards sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation, and disinfection.

The laboratory building contains a large working laboratory for students' use, and several small private laboratories for special work. In addition there are a lecture hall, museum, demonstration room, photographing room, and work shop. The hospital-stable contains a pharmacy, operating hall, post-mortem and dissecting room, besides a section for poultry, one for cats and dogs, and six sections separated from each other, for the accommodation of horses, cattle, sheep, swine, and other domestic animals.

The laboratory equipment consists of a dissecting Auzoux model of the horse, Auzoux models of the foot and the legs, showing the anatomy and the diseases of every part. There are skeletons of the horse, cow, sheep, dog, and pig, and in addition a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts, and diagrams, which are made use of in connection with lectures and demonstrations.

The laboratories are supplied with the most modern, high-power microscopes, microtomes, incubators, sterilizers, for the use of students taking the work in bacteriology and parasitology.

BOTANY

The botanical department possesses a general laboratory furnished with tables and benches for microscopic and physiological work and with a dark closet for photographic purposes. There are forty-six compound microscopes, thirty dissecting microscopes, a micro-photographic and landscape camera, and various accessories; also microtomes, paraffine baths, etc., for histological work; a large and useful collection of physiological apparatus for the study of photo-synthesis, respiration, metabolism, transpiration, heliotropism, and other irritable phenomena connected with plants; a set of apparatus for the study of the mechanical constituents of the soil; and for experimental work in soil physics. The laboratory is equipped with various devices for the study of mechanics of plant structure; several types of self-registering auxanometers used to measure the rate of growth of plants; self-registering thermometers, and hygrometers for recording constant changes in conditions.

Botanical lecture room.—The botanical lecture room adjoining the laboratory is adapted for general work in morphology and flower analysis with opportunity to use dissecting microscopes.

Botanical museum.—Directly over the botanical lecture room is a museum. It contains a collection of valuable material now undergoing rearrangement and enlargement. There is a collection of spraying solutions; an economic collection of seeds, the principal Massachusetts timber trees, with photographs and sections of the same, and many cases of interesting examples of natural and artificial grafts, girdlings, etc.

Connected with the museum is an herbarium containing about 15,000 species of flowering plants and ferns, 1,200 species of mosses, 1,200 species of lichens and liverworts, and 12,000 species of fungi, the latter collection being housed in the vegetable pathology building at the experiment station.

Adjacent to the botanical laboratory and lecture room are named collections of native and exotic trees. The various conservatories of the college and the experiment station representing over 13,000 square feet of ground surface devoted to the cultivation of a large variety of exotic plants are also available.

MATHEMATICS, PHYSICS, AND ENGINEERING

SURVEYING

The department possesses a considerable number of the usual surveying instruments with the use of which the students are required to become familiar by performing a stated amount of field work. Among the larger instruments are two plain compasses, railroad compass with telescope, surveyor's transit, two engineer's transits with vertical arc and level, solar compass, omnimeter with verniers reading to ten seconds, adapted to geodetic work. Queen plane table, two wye levels, dumpy level, builder's level, sextant, hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For draughting, a vernier protractor, pantograph, parallel rule, etc., are available.

PHYSICS

Among the apparatus in use for instruction in general physical processes may be found a set of United States standard weights and measures, precision balances, spherometer, vernier calipers, etc.; in mechanics, apparatus to illustrate the laws of falling bodies, systems of pulleys and levers, motion on an incline plane, and the phenomena connected with the mechanics of liquids and gases. The usual apparatus for lecture illustration in heat, light, and sound are also in the possession of the department. In electricity, the equipment consists of apparatus of both lecture illustration and laboratory work, among which may be enumerated a full set of Weston ammeters, and volt meters, a Carhart-Clark standard cell, Mascart quadrant electrometer, Siemens electro-dynamometer, as well as reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistance.

MILITARY SCIENCE

In addition to a large campus, suitable for battalion drill, the military department possesses a special building in which there is a drill room 60 by 135 feet, an armory, a recitation room, an office for the commandant, and a field-gun and gallery practice room. The building also has a large bathroom immediately adjoining the armory.

In a plot of ground north of the college buildings there is a rifle range, marked for practice at distances of 100 and 200 yards. The range is furnished with a revolving target suitably protected by earthworks. The national government supplies, for the use of the department, arms and equipments: the Springfield cadet rifle and two breech-loading rifled steel guns, calibre 3.2, with complete equipments and ammunition.

The State supplies instruments for the college band.

Students are held responsible for all articles of public property while in their possession.

THE CHAPEL-LIBRARY BUILDING

One of the most attractive and commodious buildings belonging to the college is the chapel-library. It has a commanding position, approximately in the center of the group of buildings adjoining the campus. The chapel occupies the entire second story. A large room, capable of seating about four hundred, is used for daily prayers, Sunday services, the various commencement exercises, and not infrequently for lectures or social gatherings. The room has an excellent pipe-organ. Two adjoining rooms are used for small religious gatherings, and meetings of the class teachers and of the faculty. The rooms can be thrown open so as to become a part of the main audience hall.

The entire lower story is given over to the library. This library is available for reference or investigation, and is open daily, except on Sundays, from 8 A. M. to 5 P. M. and from 6-30 to 8-30 P. M. It is open on Sundays from 10 A. M. to 1 P. M. The volumes at present number 25,877. The library contains carefully selected books in the departments of agriculture, horticulture, botany, entomology, and other natural sciences. Sociology, economics, history, literature, the fine arts, and the useful arts are well represented. Constant additions will be made to secure the latest and best works in the several departments of learning.

DINING-HALL

A colonial dining-hall, built of brick and equipped with all modern conveniences, was completed and opened in February, 1903, for the accommodation of students. A committee composed of two members of the faculty, two members of the student body, and the steward, manages the affairs of the dining-hall.

The hall contains a number of suites of rooms which may be secured for occupancy by young women attending any of the departments of the college.

THE HEATING, LIGHTING, AND POWER PLANT

This plant is located in the ravine near the chemical laboratory. It is equipped with two large boilers, an engine, and an electric generator. Here steam is generated which heats the college buildings on the west side of the public highway, extending from the dining hall to the veterinary laboratory. Here also is produced the electricity which lights all the buildings and the grounds of the college. Electric power is also generated which is used to drive the machinery in the dairy and in the barn. Connected with the plant is a machine shop in which much work is done for the college. The plant affords opportunity for students in mechanical and electrical engineering to observe the modern utilization of steam and of electricity.

General Information

DORMITORIES

Students are expected to occupy rooms in the college dormitories unless excused to room elsewhere.

In North College and South College, rooms, unfurnished, are arranged in suites of three. Each apartment consists of one study room and two bedrooms. In North College the corner rooms are 14 by 15 feet, and the annexed bedrooms 8 by 10 feet. The inside study rooms are $13\frac{1}{2}$ by $14\frac{1}{2}$ feet, and the bedrooms 8 by 8 feet. In South College the study rooms are 14 by 15 feet with a recess $7\frac{1}{3}$ by 3 feet, and the bedrooms $11\frac{1}{6}$ by $8\frac{5}{12}$ feet. Both buildings are heated by steam and lighted by electricity.

Students are required to care for their rooms. Military inspection by the commandant takes place every Saturday morning at 8-30 o'clock.

Rent varies according to the building and the location from $15 to $45 a year. Steam heat costs $12 yearly. Lights cost $12 yearly. Board is furnished in the college dining hall at present for $3.25 a week. Rooms in the dining-hall are reserved for women who are students in any department of the college. The rent is $18 a semester ; light and heat extra, each $12 a year.

Correspondence relative to the engaging of rooms should be addressed to Thomas Canavan, the janitor.

EXPENSES

Room rent, in advance	$15.00	$45.00
Board, $3.25 to $4 a week	117.00	144.00
Heat	12.00	12.00
Washing 30 to 60 cents a week	11.00	22.00
Military suit	12.50	20.00
Lights	12.00	12.00
Miscellaneous expenses	41.00	45.00
	$220.50	$300.00

In addition to the above expenses $120 tuition is charged to foreigners.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms for such application may be obtained from the president of the college.

The military suit must be obtained immediately upon entering college, and used in the drill exercises prescribed. The following fees are applied towards the maintenance of the several laboratories: chemical, $15 per semester used; zoölogical, $2 per semester used sophomore year; other classes $4 per semester; entomological, $3 per semester used. The fee for use of the botanical laboratory for one period of two hours during each week is $1 per semester. Other periods will be charged for proportionally. Some expense is also incurred for text-books. In exceptional cases incidental expenses necessitate additional charges.

THE LABOR FUND

An annual appropriation of $5000 is received from the State. The object of this fund is to assist only those students who are citizens of Massachusetts and are dependent either wholly or in part on their own exertions, by furnishing them work in the several departments of the college. The greatest opportunity for such work is found in the agricultural and the horticultural department.

Application for participation in the benefits of the labor fund should be made to the president of the college. Students desiring to avail themselves of its benefits must bring a certificate signed by one of the selectmen of the town in which they are resident, certifying to the fact that they require aid.

SELF-HELP

Good opportunities are afforded for self-support in part to those students who choose to avail themselves of them. But much depends upon the determination and the ability of the student applying for work. Some exceptional men have succeeded in paying their way through college. Not a few have paid a large share of their necessary expenses. Many have earned a small part of the cost of their college course. But in every case the student should have funds enough to pay his way until he can adapt himself to his new environment and show what he is capable of earning. The long summer vacation allows the student to earn good wages at home or elsewhere. There are no college exercises on Saturdays, so that work for wages may then be performed. But no student should attempt to engage in work that will interfere with his success in his studies. The labor fund is employed in paying for the labor of students who require work, but the fund is limited and the college cannot promise employment to all applicants. Each case must be determined according to the circumstances of the time and the qualifications of the man.

RELIGIOUS SERVICES

Chapel services are held every week-day except Saturday at 8 A. M. A religious meeting Thursday evening, under the auspices of the College Young Men's Christian Association is held in the chapel. Students are expected to attend divine service on Sunday with the churches of their choice in town, where a cordial welcome is accorded them.

FELLOWSHIP

A fellowship under the title of "Instructor in Chemistry" is offered to a recent graduate who desires, in connection with his regular duties as instructor, to carry on advanced work for one or more years.

SCHOLARSHIPS

ESTABLISHED BY PRIVATE INDIVIDUALS

Mary Robinson fund of one thousand dollars, the bequest of Miss Mary Robinson, of Medfield.

Whiting Street fund of one thousand dollars, the bequest of Whiting Street, of Northampton.

Henry Gassett fund of one thousand dollars, the bequest of Henry Gassett, of North Weymouth.

The income of these funds is assigned to worthy students requiring aid.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms of such application may be obtained from the president of the college.

DEGREES

No honorary degrees are conferred.

Those who complete the four years course will receive the degree of Bachelor of Science. The diploma is signed by the governor of the Commonwealth as well as by the president of the college.

Those who receive this degree may receive also the degree of Bachelor of Science from Boston University, for which a fee of ten dollars is charged; provided that the candidate in addition to the college course shall have mastered in a preparatory school a three years' preparatory course in studies beyond those commonly presented in the grammar schools of Massachusetts.

Those who complete the assigned courses will receive the degree of Master of Science for which a fee of ten dollars must be paid to the treasurer of the college.

Those who complete the three years' course of study required and present a satisfactory thesis will be given the degree of Doctor of Philosophy. The fee for this degree is twenty-five dollars.

Those to whom degrees are awarded must present themselves in person at commencement to receive them.

Prizes

The following prizes are offered annually for proficiency in the work of several of the departments of collegiate study:

AGRICULTURE

The Grinnell prizes, the first of twenty-five dollars, and the second of fifteen dollars, given by Hon. William Claflin, of Boston, in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who produce the best and the second best examinations, oral and written, in theoretical and practical agriculture.

BOTANY

The Hills prizes of thirty-five dollars, given by Henry F. Hills of Amherst, will this year be awarded to members of the senior class as follows: fifteen dollars for the best general herbarium, ten dollars for the best collection of Massachusetts trees and shrubs, and ten dollars for the best collection of Massachusetts woods.

ENGLISH

The Flint prizes, the first of thirty dollars, and the second of twenty dollars are awarded to those members of the junior class, under certain restrictions, who produce the best and the second best orations. Both composition and delivery are considered in making the award.

The Burnham prizes, amounting in all to eighty dollars, given by the late T. O. H. P. Burnham, of Boston, to members

of the sophomore, and the freshman class, for excellence in composition work and in declamation. Composition work, in competition for these prizes is confined to the second semester of the sophomore year. Under certain restrictions, a first prize of twenty dollars, a second prize of ten, and a third prize of five are awarded. Declamation work, in competition for these prizes is confined to the second semester of the freshman year. Under certain restrictions, a first prize of twenty-five dollars, and a second prize of twenty are awarded.

SPECIAL PRIZES

Special prizes are occasionally offered by various departments.

MILITARY DIPLOMAS

The commandant is authorized to give military diplomas, countersigned by the president of the college, to those men receiving the degree of Bachelor of Science who by their work in the military department during their course in college may have shown themselves worthy of distinction. These diplomas recommend those receiving them for commissions in the United States army or in the militia of the several states, vouching that they are fitted to fill the position of a commissioned officer.

SHORT COURSE PRIZES

The Dairy prizes, given by the Massachusetts Society for Promoting Agriculture, to members of the short winter course. Two sets of prizes are offered. The first set consists of three prizes of fifty, thirty, and twenty dollars, respectively, given for general excellence in all branches of the course as offered. The second set consists of three prizes of twenty-five, fifteen, and ten dollars, respectively, for excellence in the making of butter.

Award of Prizes

1903—1904

Grinnell Agricultural Prizes—Senior

First prize: Arthur Witter Gilbert
Second prize: Sidney Burritt Haskell

Hills Botanical Prizes—Senior

First prize: } Ernest Adna Back
Second prize: }

Flint Oratorical Prizes—Junior

First prize: George Howard Allen
Second prize: Albert Davis Taylor

Burnham Composition Prizes—Sophomore

First prize: Arthur Alphonse Racicot, Jr.
Second prize: Edwin Hobart Scott
Third prize: Frank Augustus Ferren

Burnham Declamation Prizes—Freshman

First prize: Charles Arthur Allenham Rice
Second prize: George Whitney Searle

Military Honors—Senior

The following cadets were reported to the Adjutant General U. S. Army, and to the Adjutant General of Massachusetts, as having shown special aptitude for military service:

Fayette Dickinson Couden
Clarence Herbert Griffin
Howard Morgan White

Short Course in Dairy Farming

Massachusetts Society for Promoting Agriculture: for general excellence: first prize, $50, Charles H. Thayer; second prize, $30, Gordon Runkle; third prize, $20, Fred S. Farwell.

Massachusetts Society for Promoting Agriculture: for highest scoring butter: first prize, $25, Chester D. Abbott; second prize, $15, Albert W. Mead; third prize, $10, Alvah G. Eldridge.

Massachusetts Society for Promoting Agriculture: for excellence in stock judging: first prize, $10, Fred M. Pick; second prize, $7.50, Gordon Runkle; third prize, $5, Homer G. Phillips; fourth prize, $2.50, Chester L. Shaw.

Special prize offered by W. H. Bowker of Boston: for best knowledge of the use of fertilizers on the farm: one-half ton Stockbridge fertilizer, Gordon Runkle.

Special prize given by B. von Herff, New York: for best knowledge of the use of fertilizers on grass lands: one ton kainite, Gordon Runkle.

Special prizes offered by Vermont Farm Machine Co, of Bellows Falls, Vt., for best print butter: first prize, $15, Albert W. Mead; second prize, $10, Alvah G. Eldridge.

Degrees Conferred in 1904

BACHELOR OF SCIENCE

Ahearn, Michael Francis†	Framingham
Back, Ernest Adna†*	Florence
Blake, Maurice Adin†	Millis
Couden, Fayette Dickinson†	Amherst
Elwood, Clifford Franklin†	Green's Farms, Conn.
Fulton, Erwin Stanley†	Lynn
Gilbert, Arthur Witter†*	Brookfield
Gregg, John William†*	South Natick
Griffin, Clarence Herbert†	Winthrop
Haskell, Sidney Burritt†	Southbridge
Henshaw, Fred Forbes†	Templeton
Hubert, Zachary Taylor†*	Pride, Ga.
Newton, Howard Douglas†*	Curtisville
O'Hearn, George Edmund†	Pittsfield
Parker, Sumner Rufus†	Brimfield
Peck, Arthur Lee†*	Hartford, Conn.
Quigley, Raymond Augustine†	Brockton
Raymoth, Reuben Raymond†	Goshen
Staples, Parkman Fisher†*	Westboro
White, Howard Morgan	Springfield
Total	20

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*Degree of Boston University
†Military Diploma

Graduate Students

Back, Ernest Adna B. Sc. Massachusetts Agricultural College 1904	*Florence*	96 Pleasant St.
Franklin, Henry James B. Sc. Massachusetts Agricultural College 1903	*Bernardston*	96 Pleasant St.
Kibbey, Richards Carroll A. B. Harvard University 1904	*Marhalltown, Iowa*	96 Pleasant St.
Osmun, Albert Vincent B. Sc. Massachusetts Agricultural College 1903	*Boonton, N. J.*	116 Pleasant St.
Staples, Parkman Fisher B. Sc. Massachusetts Agricultural College 1904	*Westboro*	96 Pleasant St.
Tottingham, William Edward B. Sc. Massachusetts Agricultural College 1903	*Bernardston*	116 Pleasant St.
Tower, Winthrop Vose B. Sc. Massachusetts Agricultural College 1903	*Roxbury*	3 Mt. Pleasant
Whipple, Orville Blaine B. Sc. Kansas Agricultural College 1904	*Olivet, Kansas*	Plant House

Total 8

Special Students

Dacy, Alice Evelyn	*Boston*	Dining Hall
French, Vida Rachel	*Cincinnati, O.*	25 Sunset Ave.
Ferguson, Mary E. Van E.	*Central Valley, N. Y.*	
Locke, Ada Elsie	*Somerville*	Dining Hall
Magoun, Alice Neal	*Bath, Maine*	4 North Prospect St.
Redding, Charlotte Wilmarth	*Amherst*	96 Pleasant St.
Thayer, Lucy Clarke	*Hadley*	15 Gaylord St.

Total 7

Undergraduate Students

SENIOR CLASS

Adams, Richard Laban	*Jamaica Plain*	108 Pleasant St.
Allen, George Howard	*West Somerville*	15 South College
Barnes, Hugh Lester	*Stockbridge*	4 South College
Bartlett, Francis Alonzo	*Belchertown*	116 Pleasant St.
Crosby, Harvey Davis	*Rutland*	5 North College
Cushman, Esther Cowles	*Amherst*	Mill Valley, Amherst
Gay, Ralph Preston	*Stoughton*	108 Pleasant St.
Gardner, John Joseph	*Milford*	12 South College
Hatch, Walter Bowerman	*Falmouth*	Plant House
Holcomb, Charles Sheldon	*Tariffville, Conn.*	5 South College
Hunt, Thomas Francis	*Weston*	11 South College
Ingham, Norman Day	*Granby*	12 South College
Kelton, James Richard	*Orange*	Kappa Sigma House
Ladd, Edward Thorndike	*Winchester*	Kappa Sigma House
Lewis, Clarence Waterman	*Melrose*	5 North College
Lyman, John Franklin	*Amherst*	West Experiment Station
Munson, Willard Anson	*Aurora, Ill.*	116 Pleasant St.
Newhall, Edwin White, Jr.	*San Francisco, Cal.*	84 Pleasant St.
Patch, George Willard	*Arlington Heights*	Tower, South College
Sanborn, Monica Lillian	*Salem*	Dining Hall
Sears, William Marshall	*Brockton*	21 North College
Swain, Allen Newman	*Dorchester*	116 Pleasant St.
Taylor, Albert Davis	*Westford*	86 Pleasant St.
Tompson, Harold Foss	*Jamaica Plain*	Veterinary Laboratory
Tupper, Bertram	*Barre*	11 South College
Walker, Lewell Seth	*Natick*	4 South College
Whitaker, Chester Leland	*Somerville*	108 Pleasant St.
Williams, Percy Frederic	*Natick*	5 South College
Willis, Grenville Norcott	*Becket*	Tower, South College
Yeaw, Frederick Loring	*Winthrop*	East Experiment Station

Total 30

JUNIOR CLASS

Carey, Daniel Henry	*Rockland*	2 South College
Carpenter, Charles Walter	*Monson*	Kappa Sigma House
Chapman, George Henry	*New Britain, Conn.*	6 South College
Colton, William Wallace	*Pittsfield*	16 South College
Craighead, William Hunlie	*Boston*	28 North College
Filer, Harry Burton	*Palmer*	24 North College
French, George Talbot	*Tewksbury*	18 South College
Gaskill, Edwin Francis	*Hopedale*	Barn
Hall, Arthur William, Jr.	*North Amherst*	North Amherst
Hastings, Addison Tyler, Jr.	*Natick*	3 Fearing St.
Hayward, Afton Smith	*Amherst*	6 Phillips St.
Hood, Clarence Ellsworth	*Millis*	6 North College
Kennedy, Frank Henry	*Ashmont*	7 South College
Martin, James Edward	*Brockton*	6 South College
Moseley, Louis Hale	*Glastonbury, Conn.*	Hatch Exp. Station
Mudge, Everett Pike	*Swampscott*	10 North College
Peakes, Ralph Ware	*Newtonville*	10 South College
Pray, Fry Civille	*Natick*	17 South College
Racicot, Arthur Alphonse, Jr.	*Lowell*	10 South College
Rogers, Stanley Sawyer	*Boston*	Kappa Sigma House
Russell, Harry Merwin	*Bridgeport, Conn.*	Insectary
Scott, Edwin Hobart	*Somerville*	Kappa Sigma House
Sleeper, George Warren	*Swampscott*	96 Pleasant St.
Strain, Benjamin	*Mt. Carmel, Conn.*	29 McClellan St.
Suhlke, Herman Augustus	*Leominster*	Kappa Sigma House
Taft, William Otis	*East Pepperell*	7 South College
Tannatt, Willard Colburn, Jr.	*Dorchester*	29 McClellan St.
Tirrell, Charles Almon	*Plainfield*	3 Fearing St.
Wellington, Richard	*Waltham*	E. H. Forristall's
Wholley, Francis Dallas	*Cohasset*	24 North College
Wood, Alexander Henry Moore	*Easton*	Kappa Sigma House
		Total 31

SOPHOMORE CLASS

Alley, Harold Edward	*Newburyport*	Kappa Sigma House
Arimoto, Shintaro	*Mimasaka, Japan*	9 Fearing St.
Armstrong, Arthur Huguenin	*Hyde Park*	Kappa Sigma House
Barlow, Waldo Darius	*Amherst*	133 Main St.
Bartlett, Earle Goodman	*Chicago, Ill.*	44 Pleasant St.
Brydon, Robert Parker	*Lancaster*	25 North College
Caruthers, John Thomas	*Columbia, Tenn.*	32 North College
Chace, Wayland Fairbanks	*Middleboro*	96 Pleasant St.
Chadwick, Clifton Harland	*Cochituate*	14 South College
Chapman, Joseph Otis	*Brewster*	3 Fearing St.
*Chapman, William Spaulding	*Attleboro*	11 North College
Clark, Milford Henry, Jr.	*Sunderland*	1 South College
Clementson, Lewis Towland	*Millbury*	Thomson House
Cowles, Edward Russell	*Deerfield*	101 Pleasant St.
Curtis, Jesse Gerry	*South Framingham*	16 South College
Cutter, Frederick Augustus	*Pelham, N. H.*	17 South College
Dearth, George Augustus	*So. Framingham*	Kappa Sigma House
Dickinson, Walter Ebenezer	*North Amherst*	North Amherst
Eastman, Jasper Fay	*Townsend*	101 Pleasant St.
Engstrom, Nils	*Lancaster*	Kappa Sigma House
Green, Herbert Henry	*Spencer*	18 South College
Hall, Walton, Jr.	*Marshfield*	116 Pleasant St.
Hartford, Archie Augustus	*Westford*	96 Pleasant St.
Higgins, Arthur William	*Westfield*	R. J. Goldberg's
Jones, Arthur Merrick	*Ludlow*	87 Pleasant St.
King, Clinton	*Dorchester*	77 Pleasant St.
Larned, Joseph Adelbert	*Amherst*	11 North College
Lincoln, Ernest Avery	*Fall River*	96 Pleasant St.
Livers, Susie Dearing	*Boston*	16 Dining Hall
Parker, Charles Morton	*Newtonville*	56 Pleasant St.
Peters, Frederick Charles	*Lenox*	13 South College
Philbrick, Edwin Daniels	*West Somerville*	14 South College
Pierce, Henry Tyler	*West Millbury*	Thomson House
Russell, Herbert Osborne	*North Hadley*	North Hadley
Shaw, Edward Houghton	*Belmont*	116 Pleasant St.
Stoddard, Calder Sankey	*Amherst*	Kappa Sigma House

Summers, John Nicholas	*Brockton*	25 North College
Thompson, Clifford Briggs	*Halifax*	13 South College
Walker, James Henry	*Greenwich Village*	1 South College
Watkins, Fred Alexander	*Peru*	7 North College
Watts, Ralph Jerome	*Littleton*	East Experiment Station
Whitney, John Frank	*Dana*	88 Pleasant St.
Wood, Herbert Poland	*Hopedale*	Thomson House

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*Died, Dec. 31, 1904.

Total 43

FRESHMAN CLASS

Allen, Charles Francis	*Worcester*	96 Pleasant St.
Allen, Herbert Carpenter	*Northfield*	9 Fearing St.
Anderson, John Albert	*North Brookfield*	9 Fearing St.
Anderson, Kenneth French	*Roslindale*	26 North College
Austin, Frank Lee	*Potsdam, N. Y.*	22 North College
Bailey, Ernest Winfield	*Worcester*	R. J. Goldberg's
Bangs, Bradley Wheelock	*Amherst*	29 Lincoln Ave
Barry, Thomas Addis	*Amherst*	86 North Pleasant St.
Bartlett, Louis Warren	*Amherst*	Mill Valley, Amherst
Bates, Carleton	*Salem*	88 Pleasant St.
Bennett, Ernest Victor	*Malden*	6 Nutting Ave
Blake, Rodman Ruggles	*East Pepperell*	96 Pleasant St.
Blakeley, Franklin Chambers	*Medford*	
Browne, Marcus Metcalf	*Malden*	6 Nutting Ave.
Caldwell, John Snow	*Lynn*	77 Pleasant St.
Carter, Henry Rufus	*Millbury*	19 Amity St.
Chapman, Lloyd Warren	*Pepperell*	E. H. Forristall's
Chase, Henry Clinton	*Swampscott*	66 Pleasant St.
Clark, Orton Loring	*Malden*	5 Mt Pleasant
Cobb, George Robert	*Amherst*	33 Cottage St.
Coleman, William John	*Natick*	6 Nutting Ave.
Cox, Leon Clark	*Boston*	15 North College
Cummings, Winthrop Atherton	*Belchertown*	L. H. Taylor's
Cutting, Roy Edward	*Amherst*	11 High St.
Damon, Henry Frank	*Belchertown*	77 Pleasant St.
Daniel, John	*Osterville*	6 Nutting Ave.
Davenport, Stearnes Lothrop	*North Grafton*	8 South College
Davis, Paul Augustin	*Lowell*	88 Pleasant St.
Dolan, Clifford	*Hudson*	9 Fearing St.
Draper, James Edwin	*Worcester*	96 Pleasant St.
Eastman, Perley Monroe	*Townsend*	E. M. Dickinson's
Edmands, Ernest Carl	*Saugus*	77 Pleasant St.
Edwards, Frank Laurence	*Somerville*	26 North College
Farley, Arthur James	*Waltham*	Thomson House
Farrar, Parke Warren	*Springfield*	101 Pleasant St.
Flint, Clifton Leroy	*Amesbury*	Kappa Sigma House

Fullam, Charles Francis	*North Brookfield*	9 Fearing St.
Gillett, Chester Socrates	*Southwick*	E. M. Dickinson's
Gillett, Kenneth Edward	*Southwick*	E. M. Dickinson's
Gold, Frank Lyman	*Amherst*	14 Gray St.
Goodwin, Chester Linwood	*Brockton*	9 Fearing St.
Gowdey, Carlton Cragg	*St. Michael, Barbados*	66 Pleasant St.
Hamburger, Amos Francis	*Hyde Park*	8 South College
Hayes, Herbert Kendall	*North Granby, Conn.*	E. M. Dickinson's
Hayward, Warren Willis	*Millbury*	Thomson House
Howe, William Llewellyn	*Marlboro*	9 South College
Hyslop, James Augustus	*Rutherford, N. J.*	14 North College
Ingalls, Dorsey Fisher	*Cheshire*	61 Amity St.
Jackson, Raymond Hobart	*Amherst*	26 Lincoln Ave.
Jennison, Harry Milliken	*Millbury*	Thomson House
Johnson, Frederick Andrew	*Westford*	96 Pleasant St.
Jones, Thomas Henry	*Easton*	E. M. Dickinson's
Lacouture, George Louis	*Millbury*	
Larsen, David	*Bridgeport, Conn.*	101 Pleasant St.
Liang, Lai Kwei	*Tientsin, China*	80 Pleasant St.
Miller, Danforth Parker	*Worcester*	Kappa Sigma House
Negus, Philip Henry	*Fall River*	44 Triangle St.
O'Grady, James Raphael	*Holliston*	6 North College
Pagliery, José Cecilio	*New York, N. Y.*	2 South College
Parker, John Robert	*Poquonock, Conn.*	86 Pleasant St.
Potter, John Sherman	*Concord*	31 North College
Reed, Horace Bigelow	*Worcester*	Professor Cooley's
Regan, William Swift	*Northampton*	R. J. Goldberg's
Sawyer, William Francis	*Sterling*	77 Pleasant St.
Shattuck, Leroy Altus	*Pepperell*	96 Pleasant St.
Smith, George Franklin	*Barre*	
Thurston, Frank Eugene	*Worcester*	27 North College
Turner, Olive May	*Amherst*	22 Spaulding St.
Turner, William Franklin	*Reading*	9 South College
Verbeck, Roland Hale	*Malden*	6 Nutting Ave.
Warner, Theoren Levi	*Sunderland*	27 North College
Waugh, Thomas Francis	*Worcester*	23 North College
Wellington, Joseph Worcester	*Waltham*	Thomson House
Wheeldon, Albert James	*Worcester*	Thomson House

Wheeler, Hermon Temple	*Lincoln*	31 North College
White, Herbert Linwood	*Maynard*	C. H. Kellogg's
Whiting, Albert Lemuel	*Stoughton*	Thomson House
Whitmarsh, Raymond Dean	*Taunton*	88 Pleasant St.
Wright, Samuel Judd	*South Sudbury*	22 North College
		Total 79

Short Course

CLASS OF 1904

Abbott, Chester Denning	Andover
Austin, Frank Lee	Potsdam, N. Y.
Blair, Alfred Wingate	Roxbury
Browning, Homer Franklin	Northfield
Dorr, Herbert Andrews	Richmond
Dunbar, Frank Andrews	Richmond
Eldridge, Alvah Gorham	Amherst
Farwell, Fred Sherman	West Fitchburg
Gaskell, Edward Thompson	Amherst
Kendrick, Harry Newell	East Charlemont
Kilbourn, Farley Eugene	Ashburnham
Mead, Albert William	Hartford, Vt.
Millard, Walter Burton	Egremont
Newcomb, Walter Lemuel	Brattleboro, Vt.
Packard, Ransom Clayton	Brockton
Perry, Arthur Asa	South Pomfret, Vt.
Phillips, Homer Grant	Hadley
Potter, Lincoln	Worcester
Pick, Fred Mortimer	Southboro
Runkle, Gordon	Waltham
Seely, Will Campbell	Hamburg, N. J.
Shaw, Chester Linus	Brockton
Smith, George Clarence	East Haddam, Conn.
Smith, Raymond Burr	Chicago, Ill.
Stearns, Lynn Lawrence	Hyde Park, Vt.
Thayer, Charles Hiram	Hadley
Twichell, Harry Sessions	Brookfield
Wilder, Frank Everett	Petersham
Wilmarth, Theophilus Williams	Sunapee, N. H.

Total 29

CLASS OF 1905

Barnes, Charles White	*Haverhill*	East Experiment Station
Carruth, Charles Mason	*Barre*	North Amherst
Carter, Henry Rufus	*Millbury*	19 Amity St.
Chase, Edward Irving	*Somerville*	30 North Prospect St.
Daniels, Francis Newell	*Foxboro*	5 Fearing St.
Davis, Warren Henry	*Great Barrington*	28 North College
Dearborn, Alvah Carr	*Amherst*	Amherst
Devlin, James Francis	*Whitinsville*	E. H. Forristall's
Dunnell, David Lawson	*Greenfield*	44 Triangle St.
Eames, William Ovid	*Becket*	9 Fearing St.
Fabian, Benedict Sebastian	*Worcester*	3 Mt. Pleasant
Filer, Charles Humphrey	*West Brimfield*	44 Triangle St.
Gaskill, Roy Frank	*Hopedale*	Hatch Barn
Gates, Oliver Horace	*Ashburnham*	44 Triangle St.
Geer, Raymond	*Wapping, Conn.*	E. H. Forristall's
Greenhalgh, Cecil Norman V.	*Plymouth*	79 Pleasant St.
Guiel, Arthur Daniel	*South Amherst*	South Amherst
Haynes, Jay Freeman	*North Hero, Vt.*	44 Triangle St.
Hollquist, Andrew Gustaf	*Worcester*	E. M. Dickinson's
James, Arthur Eugene	*North Ferrisburg, Vt.*	E. H. Forristall's
Kimball, Edward Bartlett	*Methuen*	
Lincoln, James Keyes	*Barre*	9 Fearing St.
Lucia, John Baptiste Jr.	*Middlebury, Vt.*	77 Pleasant St.
Mann, Walter Samuel	*Foxboro*	5 Fearing St.
May, Basil Morris	*South Egremont*	9 Fearing St.
McCrone, Henry Richmond	*Amesbury*	5 McClellan St.
Moore, Edwin Allyn	*Weyben, Westfield*	67 Pleasant St.
Packard, Henry Wakefield	*Goshen*	5 McClellan St.
Pomeroy, Robert Edgar	*Northampton*	44 Pleasant St.
Ranney, William Henry	*South Ashfield*	53 Pleasant St.
Raycraft, Frank Jr.	*Caldwell, N. J.*	76 Pleasant St.
Salmon, William Everett	*Boston*	97 Pleasant St.
Schmitz, Eugene Alfons R.	*Shirley*	87 Pleasant St.
Sheridan, Walter Peter	*Charlton*	5 McClellan St.
Smith, David French	*Plymouth, N. H.*	66 Pleasant St.
Smith, Morey Ambros	*Berlin, N. Y.*	5 McClellan St.

Taylor, Arthur Francis	*Amherst*	North Amherst
True, Arthur Ray	*Amesbury*	5 McClellan St.
Twitchell, Julian Phelps	*Cambridge*	97 Pleasant St.
Watley, Frank Crandall	*Davenport, N. Y.*	96 Pleasant St.
Whitney, Harvey Horace	*Shrewsbury*	97 Pleasant St.
	Total	41

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Special students	7
Seniors	30
Juniors	31
Sophomores	43
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Short course, 1905	41
Total	—268
Counted twice	1
	267

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Massachusetts	224
Connecticut	11
New York	6
Vermont	7
Illinois	3
New Jersey	4
New Hampshire	3
California	1
Iowa	1
Kansas	1
Maine	1
Ohio	1
Tennessee	1
China	1
Barbados	1
Japan	1
Total	—267

Alumni Associations

ASSOCIATE ALUMNI

Founded 1874

President, Charles E. Beach, '82, West Hartford, Conn.
Secretary, James B. Paige, '82, Amherst

ALUMNI CLUB OF MASSACHUSETTS

Founded 1885

President, Madison Bunker, '75, Newton
Clerk, Franklin W. Davis, '89, Roslindale

MASSACHUSETTS AGRICULTURAL COLLEGE CLUB OF NEW YORK

Founded 1886

President, James H. Webb, '73, New Haven, Conn.
Treasurer, Alvan L. Fowler, '80, New York, N. Y.

WESTERN ALUMNI ASSOCIATION

President, Everett B. Bragg, '75, Chicago, Ill.
Secretary, Arthur B. Smith, '95, Chicago, Ill.

CONNECTICUT VALLEY ALUMNI ASSOCIATION

Founded 1902

President, C. E. Beach, '82, West Hartford, Conn.
Secretary, H. D. Hemenway, '95, Hartford, Conn.

MASSACHUSETTS AGRICULTURAL COLLEGE CLUB OF WASHINGTON, D. C.

Founded 1904

President, Clarence B. Lane, '95, Washington, D. C.
Secretary, Bernard H. Smith '99, Washington, D. C.

Class Secretaries

1871	E. E. Thompson, Worcester
1872	S. T. Maynard, Northboro
1873	C. Wellington, Amherst
1874	
1875	M. Bunker, Newton
1876	C. F. Deuel, Amherst
1877	
1878	C. O. Lovell, New Rochelle, N. Y.
1879	R. W. Swan, Worcester
1880	
1881	J. L. Hills, Burlington, Vt.
1882	G. D. Howe, Bangor, Me.
1883	S. M. Holman, Attleboro
1884	L. Smith, Springfield
1885	E. W. Allen, Washington, D. C.
1886	
1887	F. H. Fowler, Boston
1888	H. C. Bliss, Attleboro
1889	C. S. Crocker, Boston
1890	F. W. Mossman, Westminster
1891	
1892	H. M. Thomson, Thompson, Conn.
1893	F. A. Smith, Hopedale
1894	S. F. Howard, Amherst
1895	H. A. Ballou, Barbados, W. I.

1896	
1897	C. A. Peters, Moscow, Idaho
1898	S. W. Wiley, Baltimore, Md.
1899	D. A. Beaman, Porto Rico
1900	E. K. Atkins, Northampton
1901	J. H. Chickering, Dover
1902	H. L. Knight, Middletown, Conn.
1903	G. D. Jones, North Amherst
1904	P. F. Staples, Amherst

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CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

ENSE PETIT PLACIDAM SVB LIBERTATE QVIETEM

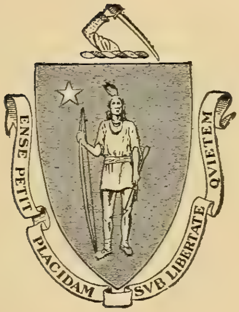
1905-1906.

CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE

1905-1906.



AMHERST
PUBLISHED BY THE COLLEGE
1906

Press of Carpenter & Morehouse,
Amherst, Mass.

Calendar for 1905-1907

1905			
September	21	Thursday	First semester begins at 8 A. M.
November	30	Thursday	Thanksgiving Day
December	20	Wednesday	Holiday recess begins at 8 A. M.
1906			
January	3	Wednesday	8 A. M. Holiday recess ends. Short course begins
February	7	Wednesday	First semester ends
February	8	Thursday	8 A. M. Second semester begins
March	14	Wednesday	Short Course ends
March	28	Wednesday	8 A. M. Spring recess begins
April	3	Tuesday	8 A. M. Spring recess ends
June	16	Saturday	Grinnell prize examination of senior class in Agriculture
June	17	Sunday	Baccalaureate Sermon
June	18	Monday	Flint prize oratorical contest Burnham prize speaking
June	19	Tuesday	Meeting of the alumni Class day exercises, battalion drill, reception by the president and the trustees
June	20	Wednesday	Commencement exercises
June	21, 22	Thursday and Friday	8-30 A. M. Examinations for admission at Botanic Museum, Amherst; Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; Pittsfield; Horticultural Hall, Worcester

Vacation of Thirteen Weeks

September	**18, 19**	Tuesday and Wednesday	8-30 A. M. Examinations for admission, Botanic Museum
September	**20**	Thursday	8 A. M. First semester begins
November	**29**	Thursday	Thanksgiving Day
December	**19**	Wednesday	Holiday recess begins at 8 A. M.
1907			
January	**2**	Wednesday	8 A. M. Holiday recess ends. Short course begins
February	**6**	Wednesday	First semester ends
February	**7**	Thursday	8 A. M. Second semester begins

Origin, Object, and Location

The Massachusetts Agricultural College was among the first of the institutions to be established under the provisions of the National Land-Grant Act of 1862. This Act donated "public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." The framer of this bill was the late Senator Justin Smith Morrill of Vermont. At the present time, over sixty institutions of higher learning in this country directly owe their origin or their prosperity to the benefits of this great educational measure.

The college was incorporated in 1864 by an Act of the State Legislature; and on the second of October, 1867, was formally opened to an entering class of thirty-three.

In January, 1875, an arrangement was made with the authorities of Boston University, whereby the college, without losing its independence, should thereafter become the "School of Agriculture" of the university. By means of this arrangement, students of the Massachusetts Agricultural College, besides obtaining the regular diploma of the college, which is accepted by American universities and by the University of Göttingen, in Germany, may, upon payment of a fee, and under certain conditions, receive the diploma in science awarded to graduates of the Boston institution. In 1882, the State Experiment Station was located on the college grounds. The station has since become connected with the college.

The college offers a free education to any American student of good character and who may fulfil the requirements for admission. Women are admitted to the courses of the institution on the same conditions as men. It offers also its courses of study to foreign students upon payment by them of a tuition fee. It gives a four years' course leading to the degree of Bachelor of Science, and graduate courses leading to the degrees of Master of Science and of Doctor of Philosophy. It offers also winter courses of ten weeks, and a special course of two weeks in bee culture.

The college is situated in the beautiful town of Amherst. The grounds are especially attractive, and comprise over 400 acres of land, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent.

Amherst is ninety-seven miles west of Boston. It is on the line of the Southern Division (Central Massachusetts) of the Boston and Maine Railroad, as well as on that of the Central Vermont Railroad. Electric cars connect with Northampton and Holyoke.

The Corporation

	Term Expires
J. HOWE DEMOND, Northampton	1907
ELMER D. HOWE, Marlborough	1907
NATHANIEL I. BOWDITCH, Framingham	1908
WILLIAM WHEELER, Concord	1908
ARTHUR G. POLLARD, Lowell	1909
CHARLES A. GLEASON, New Braintree	1909
JAMES DRAPER, Worcester	1910
SAMUEL C. DAMON, Lancaster	1910
MERRITT I. WHEELER, Great Barrington	1911
CHARLES H. PRESTON, Danvers	1911
CARROLL D. WRIGHT, Worcester	1912
M. FAYETTE DICKINSON, Boston	1912
WILLIAM H. BOWKER, Boston	1913
GEORGE H. ELLIS, Boston	1913

MEMBERS EX OFFICIO

His Excellency CURTIS GULID Jr.
Governor of the Commonwealth

WILLIAM P. BROOKS
Acting President of the College

GEORGE H. MARTIN
Secretary of the Board of Education

J. LEWIS ELLSWORTH
Secretary of the Board of Agriculture

OFFICERS OF THE CORPORATION

HIS EXCELLENCY CURTIS GUILD JR. *President*	Boston
CHARLES S. GLEASON *Vice-President*	Springfield
J. LEWIS ELLSWORTH *Secretary*	Boston
GEORGE F. MILLS *Treasurer*	Amherst
CHARLES A. GLEASON *Auditor*	New Braintree

Board of Overseers

STATE BOARD OF AGRICULTURE

EXAMINING COMMITTEE OF OVERSEERS

JOHN BURSLEY (Chairman)	West Barnstable
WARREN C. JEWETT	Worcester
CHARLES H. SHAYLOR	Lee
ISAAC DAMON	Cochituate
ALBERT H. NYE	Blandford

Faculty

William P. Brooks, ph.d. . . . . M. A. C.
Acting President and Professor of Agriculture

Charles A. Goessmann, ph.d., ll.d. . . 40 Amity St.
Professor of Chemistry

Charles Wellington, ph.d. . . . . 34 Amity St.
Associate Professor of Chemistry

Charles H. Fernald, ph.d. . . . . 3 Hallock St.
Professor of Zoölogy

*Rev. Charles S. Walker, ph.d. . . 34 Lincoln Ave.
Professor of Political Science, and Chaplain

George F. Mills, a.m. . . . . . 46 Amity St.
Professor of English and Latin

James B. Paige, d.v.s. . . . . 42 Lincoln Ave.
Professor of Veterinary Science

George E. Stone, ph.d. . . . Mount Pleasant
Professor of Botany

John E. Ostrander, a.m., c.e. . 33 North Prospect St.
Professor of Mathematics and Civil Engineering

Henry T. Fernald, ph.d. . . . . 44 Amity St.
Professor of Entomology

Frank A. Waugh, m.sc. . . . . M. A. C.
Professor of Horticulture

---

*On leave of absence

George C. Martin, Capt. 18th U. S. Inf. Amherst House
Professor of Military Science and Tactics

Richard S. Lull, Ph.D. . . 37 North Prospect St.
Associate Professor of Zoölogy and Curator of the Zoölogical Museum

Philip B. Hasbrouck, B.Sc. . . . 130 Pleasant St.
Associate Professor of Mathematics and Adjunct Professor of Physics

Herman Babson, A.M. . . . . . 3 College St.
Assistant Professor of English and Instructor in German

Fred S. Cooley, B.Sc. . . Pleasant St., North Amherst
Assistant Professor of Agriculture

S. Francis Howard, M.Sc. . . . 19 Phillips St.
Assistant Professor of Chemistry

Robert W. Lyman, LL.B. . . . . Northampton
Lecturer on Farm Law

Alfred Akerman, M.F. . . . State House, Boston
Lecturer on Forestry

Louis R. Herrick, B.Sc. . . 5 Northampton Road
Instructor in French and Spanish, and Secretary of the Faculty

Francis Canning . . . . . Mt. Pleasant
Instructor in Floriculture

Herbert P. Gallinger, Ph.D. . . Woodside Ave.
Instructor in History

George N. Holcomb, A.B., S. T. B. . . 46 McClellan St.
Instructor in Economics and Government

A. Vincent Osmun, M.Sc. . . . 96 Pleasant St.
Instructor in Botany

Sidney B. Haskell, B.Sc. . . . . Mt. Pleasant
Instructor in Agriculture

Charles G. Barnum, A.B. . . . . Mt. Pleasant
Instructor in Chemistry

Maurice A. Blake, B.SC. *Instructor in Horticulture*	M. A. C.
Henry J. Franklin, B.SC. *Instructor in Botany*	96 Pleasant St.
Nathan J. Hunting, B.SC. *Instructor in Dairying*	Shutesbury
Frederick R. Church, B.SC. *Instructor in Babcock Test*	North Amherst
Charles W. Fryhofer *Instructor in Butter Making*	9 Fearing St.
Walter B. Hatch, B.SC. *Instructor in Drawing*	Mt. Pleasant
Philip B. Hasbrouck, B.SC. *Registrar*	130 Pleasant St.

OTHER COLLEGE OFFICERS

E. Frances Hall *Librarian*	Leverett St., North Amherst
Elwin H. Forristall, M.SC. *Superintendent of Farm*	M. A. C.
Newton Wallace *Electrician*	6 Phillips St.
E. Charles Rowe *Steward of Dining Hall*	M. A. C.

Committees of the Faculty

Instruction : Professors MILLS, OSTRANDER, WELLINGTON, WAUGH, and the REGISTRAR
Electives : Professors C. H. FERNALD, PAIGE, OSTRANDER, BABSON and COOLEY
Athletics : Professors PAIGE, LULL, MARTIN, and HOWARD
Catalogue : Professor BABSON, Messrs. HERRICK and HOLCOMB, and the REGISTRAR
Entrance Examinations : Professors HASBROUCK, LULL, and BABSON
Rules : Professors LULL and HOWARD, and Mr. HOLCOMB
Graduate Courses : Professors C. H. FERNALD, WELLINGTON, STONE, and H. T. FERNALD
Schedule : Professors OSTRANDER and HASBROUCK
Dining Hall : Professors MILLS and HASBROUCK
Student Relations : Professors WAUGH, PAIGE, and COOLEY
Library : Professors STONE, MILLS, H. T. FERNALD, OSTRANDER, and BROOKS

CHAIRMAN OF THE MEETINGS OF THE INSTRUCTORS OF THE SEVERAL CLASSES

Senior class : Professor H. T. FERNALD
Junior class : Professor WELLINGTON
Sophomore class : Professor BABSON
Freshman class : Mr. HERRICK

Admission

Every candidate for admission must be at least sixteen years of age, and must present a testimonial of good character from the principal of the last school that he attended.

FOUR-YEARS' COURSE

Candidates for admission to the freshman class will be received on certificate, as explained below, or on examination in the following subjects:

Algebra, through quadratics. Plane geometry. English. General history, Myers' *General History*. Civil Government, Mowry's *Studies in Civil Government*. Physiology, Martin's *The Human Body*, briefer course. Physical geography.

This examination may be oral or written. The standard required for passing is 65 per cent. in each subject. Knowledge of the principles of arithmetic is presupposed, although an examination in this subject is not required. Inasmuch as it is found that candidates are frequently deficient in algebra and geometry, they are urged to obtain such drill in these subjects as shall secure accuracy and readiness in the application of principles to practical examples; furthermore no student found deficient in both of these subjects will be admitted to the college.

A candidate will not be accepted in English whose work is notably deficient in point of spelling, punctuation, phraseology or division into paragraphs. The candidate will be required to present evidence of a general knowledge of the subject-matter of the books named below, and to answer questions on the lives of their authors. The form of examination will usually be the writing of a paragraph or two on each of several topics to be chosen by the candidate from a considerable number—perhaps ten or fifteen—set before him in the examination paper. The treatment of these topics is designed to test the candidate's power of clear and accurate expression, and will imply only a general knowledge of the substance of the books. The books assigned for the examination are: Shakespeare's *The Merchant of Venice*; Irving's *Life of Goldsmith*; Scott's *Ivanhoe* and *The Lady of the Lake*; Tennyson's *The Princese*; Carlyle's *Essay on Burns*; Lowell's *The Vision of Sir Launfal*; Geoge Eliot's *Silas Marner.*

For examination in 1907 and 1908 the books will be: Shakespeare's *The Merchant of Venice*; Irving's *Life of Goldsmith*; Scott's *Ivanhoe* and *The Lady of the Lake*; Tennyson's *The Princess*; Coleridge's *The Ancient Mariner*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner.*

TIME, PLACES, AND ORDER OF EXAMINATIONS

The regular examinations for admission in 1906 will be held in the Botanic Museum of the Agricultural College, in Amherst, on Thursday and Friday, June 21 and 22, and on Tuesday and Wednesday, September 18 and 19, as follows:

First day:	8-30 A. M.	Registration
	9-00 A. M.	English
	11-00 A. M.	General history
	2-00 P. M.	Geometry
Second day:	9-00 A. M.	Civil government
	10-00 A. M.	Algebra
	2-00 P. M.	Physiology
	3-00 P. M.	Physical geography

There will be given, in addition, at 7 P. M., Sept. 19, in the Drill Hall, an examination to those who may desire to pass off French, Course I. The main requirements are a good accent and an ability to translate accurately and fluently selections from modern French literature.

Entrance examinations in June will be held on the same days and in the same order as in Amherst, at Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston; at Horticultural Hall, Worcester, and at Pittsfield. Candidates desiring to be admitted to college at times other than the beginning of the year, may be examined at the convenience of the officer in charge, but not during the summer vacation.

Preliminary examinations in one or more of the required subjects may be taken a year before the candidate expects to enter college, and credit for passing an examination in any subject will stand for two years after the examination.

ADMISSION ON CERTIFICATE

Certificates of schools and academies approved by the faculty of the college are accepted in place of examinations. These certificates must be made out on blanks furnished to the principal only, on application to the registrar, and must be signed by the principal of the school. Students entering on certificate may offer physics or chemistry in place of physiology or physical geography.

A student admitted on certificate may be dropped from college at any time during freshman year, when his work is not satisfactory; and the privilege implied in the acceptance of a certificate may be revoked whenever, in the judgment of the faculty, the student, either through lack of ability or of application, fails to attain the standard required.

ADMISSION TO ADVANCED STANDING

Candidates for classes more advanced than the freshman class will be examined in the studies which have been pursued by the class to which they desire admission.

Courses of Instruction

FOR THE DEGREE OF BACHELOR OF SCIENCE

AGRICULTURE

Freshman year, first semester, three hours a week.

Introduction. Relations of federal and state governments to agriculture, four lectures. History of agriculture, tenure of land, rents, holdings, etc., six lectures.

Animal breeding. Shaw's *Breeding Animals*, lectures and discussion of principles of breeding.

Assistant Professor COOLEY

Sophomore year, first semester, seven weeks, four exercises a week in class room. Breeds of farm live stock: sheep, cattle. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.* Assistant Professor COOLEY

Sophomore year, first semester, nine weeks, four exercises a week in class room. Horses and swine. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.*

Assistant Professor COOLEY

Sophomore year, second semester, eight weeks, three hours a week. Dairying. Lectures on dairy farming, milk production, handling and marketing of milk, milk preservation and modification, and products of milk. Text-book, Wing's *Milk and Its Products.* Assistant Professor COOLEY

Sophomore year, second semester, ten weeks. Soils; formation, classification, composition; physical and chemical characteristics, and their relations to maintenance and increase in productiveness. Brooks' *Agriculture*, Vol. I, supplemented by lectures and laboratory work. Professor BROOKS

Junior year, first semester, ten weeks, elective. Methods of soil improvement, including tillage, drainage, and irrigation. Brooks' *Agriculture*, Vol. I, supplemented by lectures, laboratory work, and practical exercises. Professor BROOKS

Junior year, first semester, four weeks, elective. Manures; production, composition, properties, adaptation and use. Brooks' *Agriculture*, Vol. II, supplemented by lectures and practical exercises. Professor BROOKS

Junior year, first semester, four weeks, elective. Stock judging. Assistant Professor COOLEY

Junior year, second semester, elective. Fertilizers, including a critical study of their production, composition, properties, adaptation and use; and green manuring. Brooks' *Agriculture*, Vol. II, supplemented by lectures, laboratory work and practical exercises. Professor BROOKS

Senior year, first semester, four weeks, four hours a week, elective. Silos and ensilage; historical development; the merits and methods of construction of the different kinds of silos; the crops suited for ensilage; ensilage machinery; the methods of filling the silo; and the nature and extent of the changes taking place in ensilage as affecting food value. Lectures, books of reference, and practical exercises.

Professor BROOKS

Senior year, seven weeks, first semester, four hours a week, elective. Feeding animals; principles of digestion and animal nutrition, a study of feeding stuffs (coarse and concentrated). The relation of food to product; compounding rations. Armsby's *Cattle Feeding*, lectures and discussion.

Assistant Professor COOLEY

Senior year, first semester, seven weeks, four hours a week, elective. Dairying: selection and management of the dairy farm, dairy cattle, chemical and physical properties of milk, etc., cream, butter, cheese, and by-products.

Assistant Professor COOLEY

Senior year, first and second semester, two exercises a week, for ten weeks. Dairy practice; use of separators, Babcock tester, butter making, etc. SPECIALISTS

Senior year, second semester, elective. The crops of the farm and crop rotation; including a study of the origin and agricultural botany of all the leading crops of the farm; annual forage crops, grasses and legumes, cereals, root-crops, vegetables, tobacco, and other special commercial crops. The production and use of each; the varieties and methods of improvement; the adaptation to soil; the special manurial requirements; and the methods of raising and harvesting are considered. Lectures, reference books, and field work.

Professor BROOKS

Senior year, second semester, elective. Agricultural experimentation: objects, methods, sources of error; interpretation of results. Lectures and study of reports, bulletins, etc.

Professor BROOKS

Senior year, second semester, elective. Farm management; selection of the farm, its subdivisons and equipment, buildings, fences, roads, water supply; farm capital, permanent, perishable, and floating. The labor of the farm and its management; farm power and farm machinery. Lectures and practical exercises. Professor BROOKS

Seminar courses, by arrangement, for advanced students.

Special problems requiring experiment or other research investigation will be assigned to students fitted for and desiring such work.

Training and practice in the use of farm implements and machines by arrangement when desired.

HORTICULTURE

This department endeavors to give the student a working knowledge of horticulture on its practical and on its scientific side. The attempt is made to inculcate a taste and an enthusiasm for horticultural pursuits, in place of distaste and dislike for the drudgery of farm life. On these things success and further progress chiefly depend.

The courses now offered are as follows, though others will be added as occasion requires:

1. *Sophomore class*, second semester. The fundamental operations of horticulture—propagation, pruning and cultivation—as related to the physiology of the plant. During the first half of this course Bailey's *Nursery Book* is used as a text.
Mr. Blake

2. *Junior year*, first semester. Pomology. This course covers the three natural divisions of the subject, viz.: (a) systematic pomology, or the study of the fruits themselves; (b) practical pomology, or the practice of fruit growing; (c) commercial pomology, or the principles underlying the marketing of fruits. The course is pursued by means of text-book, lectures, laboratory, and field exercises. Mr. Blake

3. *Junior year*, second semester, four periods a week. Market gardening, including the raising of vegetables and small fruits. Locations, soils, methods of cultivation and marketing. Text-book, Bailey's *Principles of Vegetable Gardening*, lectures, and field exercises. Mr. Blake

4. *Senior year*, general horticulture, a special review of pomology, and a course of lectures in plant breeding, four hours a week. Professor Waugh

5. *Senior year*. Floriculture. The construction and management of frames and glasshouses, greenhouse and florists'

crops, exhibiting, scoring, judging, etc. Text-book, lectures, and practical exercises, four hours weekly. Mr. CANNING

6. Individual problems will be assigned to seniors who elect horticulture. This gives the student an opportunity for specialization in various lines of fruit growing, vegetable culture, greenhouse management, landscape gardening, etc.

Professor WAUGH, Mr. BLAKE, and Mr. CANNING

A seminar, made up of all students electing advanced work in horticulture, floriculture or landscape gardening, meets weekly for the discussion of any matters pertaining to the subject. Successful and noted horticulturists from outside the college are frequently present at these meetings to speak on the topics with which they are especially identified.

LANDSCAPE GARDENING

The college wishes to promote the work in landscape gardening in every way possible. The aim of the courses is to give the general student an understanding of the fundamental principles of design and of good taste as applied to gardening; and to prepare advanced students for the practice of landscape gardening in its various branches.

Although a variety of other work along related lines is available, the courses now defininitely offered are follows:

1. *Junior year*, first semester, three periods a week. Materials. This course is designed to give the student an intimate acquaintance with the trees, shrubs, and other plants used in landscape gardening.

Professor WAUGH, Mr. CANNING, and Mr. HATCH

2. *Junior year*, first and second semesters, four hours a week. Elements of landscape design. The fundamental principles under-lying the artistic development of parks, estates, gardens, and other areas, together with some of the simpler

applications to practical conditions. During the first half of the term Waugh's *Landscape Gardening* will be used as a text.
Professor WAUGH and Mr. HATCH

3. *Senior year*, first and second semesters, four laboratory periods a week. Advanced landscape gardening. Lectures, conferences, field exercises, and extensive practice work, with criticism. The student is given definite problems to solve, these problems being arranged in such an order as to develop the subject logically in the student's mind.
Professor WAUGH and Mr. HATCH

FORESTRY

The act passed by the General Court of 1904 establishing the office of state forester directed that one of the duties of this officer should be to give annually a course of lectures on forestry at the Massachusetts Agricultural college. This course was given for the first time during the spring semester, 1905. It consists of lectures on the general principles of forestry, the formation, regeneration, and exploitation of forests, etc., but gives special attention to farm forestry or the management of small wood lots. The lectures are accompanied by a number of field exercises in the college wood lot and in nearby forests. The whole is under the direct charge of the State Forester, Mr. Alfred Akerman, a graduate of the Yale Forestry School, in direct co-operation with the Horticultural department of the college.

CHEMISTRY

This course aims to inculcate accurate observation, logical thinking, systematic and constant industry, together with a comprehensive knowledge of the subject. Instruction is given by text-book, lectures, and a large amount of laboratory work under adequate supervision. The laboratory work at first consists of a study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by a quantitative analysis of salts, minerals, soils, fertilizers, animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest, such as the production of sugar, starch, and dairy products; the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders and foods; and the analysis of soils, waters, milk, wine, and other animal and vegetable products.

The courses are as follows:

Freshman year, second half of second semester, four hours a week. General chemistry, Part 1, principles of chemistry, nonmetals. Newth's *Inorganic Chemistry*.

Assistant Professor Howard

Sophomore year, first semester, six hours a week. General chemistry, Part 2, metals. Assistant Professor Howard

Second semester, five hours a week. Subject continued, dry analysis. Assistant Professor Howard

Junior year, first semester, eight hours a week. Qualitative and quantitative analysis, organic chemistry. Four hours a week; special subject. Professor Wellington

Second semester, ten hours a week. Organic chemistry. Remsen's *Organic Chemistry*. Five hours a week; special subject. Professor Wellington

Senior year, first semester, three hours a week. Chemical industries. Professor Goessmann

Eight hours per week; quantitative analysis and physical chemistry, Reychler-McCrae's *Physical Chemistry*.

Professor Wellington and Assistant Professor Howard

Second semester, eight hours a week. Advanced work with lectures. Professor Wellington

GEOLOGY

1. Mineralogy, *Junior year*, second semester, six weeks, three hours a week. A course of systematic determinative mineralogy based on Brush's *Manual.* This work is carried on in the laboratory and consists in determining the minerals by a study of lustre, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests.
Assistant Professor Howard

2. Geology, *Junior year*, second semester, twelve weeks, three hours a week. Structural, dynamical, physiographical,and historical, based upon Scott's *Introduction to Geology.* The course aims to give a review of the physical condition of the earth; the various dynamic agencies and the results of their activities; the origin and the structure of rocks; and finally, the geological history of the globe and the appearance in time and the development of the principal races of animals and plants.

The museum, lantern slides, and the classic Connecticut Valley afford ample means for illustration. Professor Lull

ZOÖLOGY

1. Anatomy and physiology, *Freshman year*, one-half of the second semester, four hours a week. A lecture course based upon Martin's *The Human Body*, advanced course, supplemented by demonstrations from the charts and models and from microscopic and other preparations. The fact that the subject is required for entrance makes it possible in a comparatively brief period to review the main features of human anatomy, the generally accepted views concerning the physiology

of the various organs, and the more essential laws of health; and, aside from the practical value of the last, the knowledge of the human system thus gained aids greatly in the zoölogical work to come. Professor LULL

2. Zoölogy, *Sophomore year*, first semester, two periods a week. This is mainly a laboratory course, the aim being to familiarize the student with the structure of a number of typical forms, representive of the chief phyla of the animal kingdom, to train him to more precise habits of observation, and to lay the foundation for a more thorough understanding of laboratory technique. Lectures, amply illustrated by specimens, charts, and lantern slides, supplement and render orderly the knowledge gained in the laboratory. Professor LULL

3. Zoölogy, *Junior year*, four perods a week. A course in comparative morphology and systematic zoölogy based upon Parker and Haswell's *Text-book of Zoölogy*. Opportunity is given for the careful dissection of each of the typical forms, or its equivalent, described in the text, with a further series of animals for comparative study. Special attention is paid to individual and racial development, adaptation, relationship of animals to one another and to plants, geological and geographical distribution of animals, and the economic importance of the different groups, except the insects, both living and extinct. The lectures are illustrated by the very complete museum collection. Professor LULL

ECONOMICS AND GOVERNMENT

The aim of this department is to introduce the student to such studies as may enable him to deal with economic problems, and to fulfill his social and political duties. In all work of the department the text-book and lecture systems are combined.

1. Economics, *Junior year*, first semester, four hours a week. Fetter's *Principles of Economics* and Taylor's *Introduction to Agricultural Economics* are used as text-books. The lectures on general economics are intended to supplement Ely's book, with emphasis on present-day problems. The lectures on agricultural economics treat of the history of the agricultural industry, and existing agricultural economic conditions and tendencies in the United States. Such subjects as the resources of the various geographical divisions of our country in land and labor, the application of division of labor to agriculture, specialized and diversified farming, the large and small farm systems, tenure of farm lands, the distribution of farm products, tendencies toward agricultural coöperation, and those characteristics of agriculture which make it especially attractive to the liberally educated mind are briefly treated. Special papers, on subjects selected by the individual students from an assigned list, are read and discussed in the class room.

2. Government, *Senior year*,four hours a week during the last half of the first semester and the whole of the second. Woodburn's *The American Republic* is used as a text-book, supplemented by assigned readings in Hart's *Actual Government* and Buchanan's *Massachusetts Town Officers*. The lectures treat of general sociology,the theory and forms of the state,the origin and history of American political institutions, political parties and movements in the United States, and eminent political leaders and interpreters of the Constitution. Special attention is given to the United States Department of Agriculture, State Boards of Agriculture, Agricultural education, and the organization of the New England country town. Mr. Holcomb

Lectures on law, *Senior year*, second semester, one hour a week. This course treats of laws relating to business, especially to business connected with rural affairs, citizenship, domestic relations, farming contracts, riparian rights, real estate, and common forms of conveyance. Practical work is required such as may fit one to perform the duties of a justice of the peace. Mr. LYMAN

ENGLISH

This department aims to secure: (a) ability to give written and oral expression of thought in correct, effective English; (b) acquaintance with the masterpieces of American and English literature; (c) ability to present, logically and forcibly, oral and written arguments on propositions assigned for debate.

The following courses are offered: under (a) rhetoric and oratory; under (b) American literature and English literature; under (c) argumentation. The elective course in senior year is in language and literature.

1. Rhetoric. This course extends through the two semesters of freshman year, and through the second semester of sophomore year. In the first semester of freshman year, work is confined to essay writing and to personal criticism, by the instructor, of the students' compositions. This criticism is offered to each student individually. At stated intervals during the semester necessary information with regard to the preparation of essays is furnished each student. In the second semester of freshman year, the study of literary types is undertaken in the form of class-room work in prose composition, including exposition, persuasion, narration, description, and in prose diction, including usage and style. Special attention is given to the training of the inventive ability of the student. The textbook used is Baldwin's *College Manual of Rhetoric*. In the second semester of sophomore year, individual work in essay writing is again taken up, largely based upon the previous work of the class in American literature. (See 3 below.) Here also personal criticism is offered. Assistant Professor BABSON

2. Oratory. Individual drill in declamation, first in private and then before the class, is given during the second semester of freshman year. The choice of speakers for the Burnham prizes is based upon this work. In the junior year, during the first semester, at least two orations, upon subjects assigned or chosen, are written, and delivered before the class. Every oration is criticised by the instructor before it is committed to memory by the student. The choice of speakers for the Flint prizes in oratory is based upon this work.

Professor MILLS and Assistant Professor BABSON

3. Literature. American literature is studied in the first semester of sophomore year, three hours a week. The course comprises, first, the careful study of a text-book. Newcomer's *American Literature*, together with recitations based upon the same; secondly, the taking of notes from lectures, dwelling upon topics not fully treated in the text-book; and thirdly, the reading outside of the class-room of assigned selections from the prose and poetical works of standard American authors.

Assistant Professor BABSON

The history of English Literature is studied during the second semester of sophomore year, four hours a week. The work is based upon a text-book, this year Johnson's *History of English and American Literature.* The topical method is followed in recitation, and instead of formal lectures, there are discussions of points requiring a fuller development than the text-book gives. Collateral readings of literature are required. Frequent written tests are given in which particular attention is given to (a) the definition of words used in the text-book; (b) the use of English in the development of the topics unfolded in the text-book or discussed in the class-room.

Professor MILLS

4. Argumentation. Four hours a week during the first

semester of junior year are given to written and oral argumentation. The course is outlined as follows: (a) principles of argumentation as laid down in a text-book or by lecture; (b) briefs and brief-making; (c) briefs developed into forensics and submitted for personal criticism; (d) debates.

Professor Mills

Senior elective course, two semesters, four hours a week. The work in this course is upon the following subjects: (a) English language, its origin, history, and development, with particular attention to the study of words as outlined in Anderson's *A Study of English Words*; (b) English literature, principally of the eighteenth and the nineteenth centuries.

Professor Mills

VETERINARY SCIENCE

The course of instruction in veterinary science has been arranged to meet the demands of the students, who, after graduation, purpose following some line of work in practical agriculture. Particular stress is laid upon matters relating to the prevention of disease in animals. In addition, the interests of prospective students of human and comparative medicine have been taken into account in the arrangement of the course of study. The subject is taught by lectures, laboratory exercises, demonstration, and clinics.

Senior year, first semester, four hours a week, elective. Veterinary hygiene, comparative (veterinary) anatomy, general pathology. Professor Paige

Second semester, four hours a week. Veterinary materia medica and therapeutics; theory and practice of veterinary medicine; general, special, and operative surgery; veterinary bacteriology and parasitology; medical and surgical clinics.

Professor Paige

BACTERIOLOGY

The instruction in bacteriology is given by means of lectures, recitations, and laboratory exercises. The object of this course of study is to acquaint the student with the various organisms found in air, water, soil, milk, and the body, and their relation to such processes as decomposition, fermentation, digestion, and production of disease. The toxic substances resulting from the growth of organisms are considered, as well as the antitoxins used to counteract their action.

Senior year, first half of the first semster, six laboratory exercises of two hours each a week. Required.

Professor PAIGE

BOTANY

The object of the course in Botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. The undergraduate work extends through six semesters. The first two semesters are required. An outline of the course follows :

Freshman year, first semester, five hours a week. Laboratory work and lectures. Histology and physiology of the higher plants. This includes a study of the minute structure of the plant organism, such as stems, roots, leaves, seeds, etc., together with their functions and their chemical and physical properties. This course extends into the next semester.

Mr. OSMUN

Freshman year, second semester, three hours a week. Laboratory work, lectures, and text-book. Outlines of classification and morphology of the higher plants. This course follows the preceding one, and commences about the first of March. It is devoted to a study of the relationship of plants, their gross structure, together with extensive individual practice in flower analysis. An herbarium of 200 species of plants is required of each student.

Mr. Osmun

Junior year, first semester, five hours a week, two laboratory exercises and one lecture period a week. Cryptogamic botany. This includes a study of the lower forms of plant life necessary for a comprehension of the following courses.

Mr. Osmun

Junior year, second semester, five hours a week, two laboratory exercises and one lecture period a week. Elements of vegetable pathology and physiology. This course includes a study of the common fungus diseases of crops, and consideration of the method of prevention and control of the same. The plant's function as related to susceptibility to disease is also taken up. All of the junior botany is included in four of the junior elective courses. Professor Stone

Senior year, elective, both semesters, three laboratory exercises and one lecture period a week. (a) Plant physiology. (b) Plant pathology. Either course is optional. This course is adapted to students who desire a more detailed knowledge of plant diseases and plant physiology. Extensive use is made of the valuable and constantly increasing experiment station literature. Professor Stone

MATHEMATICS, PHYSICS, AND ENGINEERING

This department has charge of the instruction in mathematics, physics, civil engineering, and drawing. The aim is to secure thorough work in the fundamental principles and train the mind in clear and logical thinking. The application of the subjects to practical problems is given special attention. The work of the department extends over the four years as outlined below.

MATHEMATICS

Freshman year, first semester, five hours a week. Higher algebra, including ratio and proportion, progressive binomial theorem, series, undetermined coefficients, logarithms, continued fractions, permutations. Wells' *College Algebra.*
Professors OSTRANDER and HASBROUCK

Second semester, two hours a week. Solid geometry. Wells' *Solid Geometry.* Professor HASBROUCK

Plane trigonometry, two hours a week. Lyman and Goddard's *Plane Trigonometry.* Professor OSTRANDER

Junior year, for mathematical and chemical students, first semester, four hours a week. Analytic geometry of the line, circle, conic sections, and higher plane curves. Nichols' *Analytic Geometry.* Professor HASBROUCK

Second semester, four hours a week. Differential and integral calculus. Osborne's *Calculus.* Professor HASBROUCK

PHYSICS

Sophomore year, first semester, four hours a week. Elementary mechanics of solids, liquids and gases, heat, and sound. Dana's *Elementary Mechanics*, Carhart's *University Physics.*
Professor HASBROUCK

Second semester, four hours a week. Electricity, magnetism, and light. Carhart's *University Physics.*
Professor HASBROUCK

Senior year, elective for those students who have taken junior mathematics; first semester, four hours a week. Analytic mechanics. Peck's *Analytic Mechanics.*
Professor HASBROUCK

Second semester, four hours a week. Laboratory work.
Professor HASBROUCK

CIVIL ENGINEERING AND SURVEYING

Sophomore year, second semester, two exercises of two hours a week. Plain surveying with field work, including the use of the usual surveying instruments. Text-book and lectures.

Professor OSTRANDER

Instruction in Civil Engineering will be given in two distinct courses of one year each, the courses alternating. They will be open to students of the junior and senior classes as indicated below. The course for 1906-7 will be for students in mathematics only. First semester, three hours of recitation and two hours of draughting a week; stresses in roofs, bridges and graphic statics. Merriman and Jacoby's *Roofs and Bridges*, Parts I and II.

Second semester, four hours a week. Hydraulics and sanitary engineering. Merriman's *Hydraulics*, and lectures.

Professor OSTRANDER

The course for 1907-8 will be required of juniors and seniors taking the courses in mathematics and landscape gardening.

First semester, four hours a week. Strength of materials, foundations, and masonry construction. Text-book and lectures.

Professor OSTRANDER

Second semester, three hours recitation or lectures and two hours field work or draughting a week. Topographic and higher surveying, highway construction, the measurement of earthwork, pavements and railroad construction. Text-book and lectures.

Professor OSTRANDER

DRAWING

Junior year, first semester, two two-hour sessions a week for students in mathematics, and landscape gardening; free hand drawing.

Second semester, two two-hour sessions a week. Mechanical and topographic drawing.

ENTOMOLOGY

The importance in every department of life of a knowledge of insects is recognized by placing an introductory course in this subject as a required study among the junior elective courses —(1) agriculture, (2) horticulture, (3) biology, (4) landscape gardening. For those who desire a further knowledge of it, because of its importance to their future occupations, a senior elective is offered, so shaped as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry, or science teaching, as life occupations.

Junior year, second semester, four exercises a week, of two hours each. Lectures, laboratory, and field work; general consideration of the structure and life histories of insects; systematic study of the groups of insects with particular reference to those of economic importance; methods for preventing or checking their ravages; insecticides and apparatus for their use; the collecting, mounting, and naming of insects, and examination of the work of insects in the field and laboratory.

Professor H. T. Fernald

Senior year, elective, first and second semesters, three laboratory exercises of two hours each a week. One lecture per week. Lectures, laboratory and field work; advanced morphology of insects; economic entomology; training in the determination of insects; use of literature on entomology; study of the life histories of insects; value and application of insecticides; thesis on insects most closely related to future occupation of the student.

Professors C. H. Fernald and H. T. Fernald

MODERN LANGUAGES

French

Course I. Requires four hours a week for both semesters of the freshman year. The special aim of this course is to enable the student to lay the foundation of an ability to read modern French fluently special reference being had to scientific journals and treatises. The object of the grammar drill is to give not only instruction in the broader and more general topics, but also a thorough drill in the idiomatic peculiarities of the language, a thorough comprehension of which is held to be absolutely essential to a correct and accurate translation. Great stress is laid upon the acquisition of a good vocabulary and absolute accuracy in translation is insisted upon. The course is further strengthened by drill in pronunciation, exercises and composition, and, in general, in whatever tends to increase interest, facility and ability in accurate sight translation.

Course II is given upon demand as a supplement to Course I and is elective for both semesters of the senior year, for four hours a week. Its aim primarily is to furnish by an additional year's training, a greater practical efficiency in translation than can be attained merely by the completion of Course I; and secondarily, to equip the student with a general knowledge of scientific French literature. Constant advanced drill is furnished along the general lines of Course I, with the object of attaining such masterly of the language that it may be easily used as a tool in scientific pursuits and investigations of any nature.

Students who have not attained a good rank in Course I are not encouraged to elect Course II.

Though the main object of both courses is practical, a general attempt is constantly made by the comparison of French and English; by occasional lectures on French life and customs, to interest the student in the study and better comprehension of the genius of his own language and to encourage a desire for a broad and general culture.

SPANISH

Spanish is given at present as an elective for four hours a week during both semesters. This course is open as a regular study to Seniors and to Freshmen who upon entering college have passed off French or German (Course I), and also as an extra to any student in good and regular standing. It is offered in response to the recognized demand in Spanish speaking countries for graduates of agricultural colleges who have made a specialty of Agriculture, Entomology, Horticulture, Engineering, etc. Students planning future fields of work in such countries are thus enabled to acquire sufficient facility in reading, writing and speaking the Spanish language to start there to best advantage. The earlier work is based upon some such grammar as Marion and Garennes' *Introducción á la Lengua Castellana.* The course is strengthened by writing from dictation, and by the reading of books characteristic of modern Spanish life and customs.

GERMAN

Course I. Required for both semesters of sophomore year, three hours a week, first semester ; three hours a week, second semester. An understanding of the rudiments of grammar, facility in translation, and an ability to pronounce the language and to understand simple spoken German are the main objects in view. Assistant Professor BABSON

Course II. Elective for both semesters of senior year, four hours a week. Special attention is given to the reading of German, particularly to German of a scientific nature. Work is also required in prose composition throughout the year. Accuracy in pronunciation, the ability to understand and to use German within reasonable limits are also features of this course. Students electing Course II must have a good record in Course I, or must pass a satisfactory examination therein.

Assistant Professor BABSON

MILITARY SCIENCE

" In compliance with the provisions of an act of Congress, of July 2, 1862, military instruction under a regular army officer, detailed for this purpose, is required of all able-bodied male students. Men are excused from attendance upon the exercises of this department only upon presentation of a surgeon's certificate, given by a resident physician.

The object of such instruction is to disseminate clearly the elements of military knowledge throughout tbe country, wherby, in case of sudden emergency, a sufficient number of well-trained, educated men may be found properly to command and to instruct volunteer troops. Military drill also has the object in view of giving the student physical exercise, of teaching him to respect and to obey those in authority, without detracting from pride of manhood, and of developing a military bearing and courtesy becoming in a citizen as in a soldier.

In order further to stimulate in colleges the study of military science, the War Department issued General Orders No. 101, dated Washington, D. C., June 29, 1905, as follows :

" The reports of the regular inspections of the colleges and schools to which officers of the army are detailed, in pursuance of law, as principals or instructors, will annually hereafter be submitted to the General Staff for its critical examination, and the chief of staff will report to the Secretary of War, from the institutions which have maintained a high standard, the six institutions whose students have exhibited the greatest interest, application, and proficiency in military training and knowledge. The President authorizes the announcement that an appointment as second lieutenant in the Regular Army will be awarded to an honor graduate of each one of the six institutions, provided sufficient vacancies exist after caring for the graduates of the Military Academy at West Point and the successful competitors in the annual examination of enlisted men." * * * *

By order of the Secretary of War.
Signed ADNA R. CHAFFEE,
Lieutenant General, Chief of Staff.

Course I. Out of doors, an exercise of one hour, three times a week, Mondays, Tuesdays, and Thursdays; infantry drill by squad, company, and battalion; guard mounting, dress parade, inspection, and review; artillery drill by detachment; target practice.

All drills are in the drill hall during the winter months and inclement weather.

Students assigned to the college band are given instruction and practice in band music and band evolutions, in place of drills and recitations.

Course II. Theoretical instruction for freshmen, one hour a week for both semesters, comprises recitations in Infantry Drill Regulations. *Manual of Guard Duty and Firing Regulations for Small Arms. United States Service Manuals.*

Course III. Theoretical instruction for seniors during both semesters, one hour a week, embraces drill and army regulations; duties of sentinels and guard duty; elements of military science; preparation of necessary reports and returns pertaining to a company of infantry; and a thesis on some military subject. *Regulations and Field Service*, and Wagner's *Elements of Military Science.* CAPT. GEORGE CHIPMAN MARTIN

SYNOPSIS OF THE COURSES OF INSTRUCTION

The figures indicate the number of exercises a week; light-faced type, recitation periods of one hour each; heavy-faced type, laboratory periods of two hours each.

FRESHMAN YEAR

First Semester

Language	English	1
	French	4
Mathematics	Algebra	5
Science	Agriculture	4
	Botany **2**+1	3
Military	Tactics	1
History		2
		—20

Second Semester

Language	English	4
	French	4
Mathematics	Geometry and trigonometry	4
Science	Anatomy and physiology, half semester Chemistry, half semester,	4
	Botany **1**+1	2
History		2
		—20

SOPHOMORE YEAR

First Semester

Language	English	3
	German	4
Physics		4
Science	Agriculture	4
	Chemistry	**3**
	Zoölogy **1**+1	2
		—20

Second Semester

Language	English	4
	German	3
Physics		4
Surveying		2
Science	Agriculture 2+1	3
	Chemistry 2+1	3
	Horticulture	3
		—22

JUNIOR YEAR

First Semester

Course in Agriculture	Agriculture 3+1	4
	Botany 2+1	3
	Chemistry	3
	Economics	4
	Horticulture	3
	English	4
		—21
Course in Horticulture	Horticulture	4
	Horticulture 1+3	4
	Botany 2+1	3
	Chemistry	3
	Economics	4
	English	4
		—22
Course in Biology	Zoölogy 3+1	4
	Botany 2+1	3
	Chemistry	3
	Economics	4
	Horticulture	3
	English	4
		—21
Course in Chemistry	Chemistry	4
	Agriculture 3+1	4
	Mathematics	4
	Economics	4
	English	4
	Special subject	2
		—22

Course in Mathematics	Analytical geometry	4
	Engineering **1**+3	4
	Free-hand drawing	2
	Landscape gardening	4
	Economics	4
	English	4
		—22

Course in Landscape Gardening	Landscape gardening	4
	Agriculture 2+**1**	3
	Botany **2**+1	3
	Free-hand drawing	2
	Horticulture	3
	Economics	4
	English	4
		—23

Second Semester

Course in Agriculture	Agriculture 2+**1**	3
	Botany **2**+1	3
	Chemistry	**4**
	Horticulture	**2**
	Entomology	**4**
	Geology	3
		—19

Course in Horticulture	Horticulture	4
	Botany **2**+1	3
	Chemistry	**4**
	Landscape gardening	2
	Entomology	**4**
	Geology	3
		—20

Course in Biology	Entomology	**4**
	Zoölogy	**3**
	Botany **2**+1	3
	Chemistry	**4**
	Horticulture	**2**
	Geology	3
		—19

Course in Chemistry	Chemistry	**5**
	Agriculture 2+**1**	3
	Mathematics	4
	Geology	3
	Special subject	5
		—20

Course in Mathematics	Engineering	4	
	Mathematics	4	
	Mechanical drawing	**2**	
	Landscape gardening	4	
	Geology	3	
			—17
Course in Landscape Gardening	Landscape gardening	4	
	Botany **2**+1	3	
	Mechanical Drawing	**2**	
	Engineering	5	
	Entomology	**4**	
	Geology	3	
			—21

SENIOR YEAR

First Semester

The following subjects are required in all courses :

Bacteriology, half semester, **4**, Government, half semester, 4,	4	
Military science	1	
		—5

Second Semester

Government	4
Military science	1

From the following, the student must elect three courses, closely correlated with his junior year course. Only one course in language can be elected.

Agriculture	4	Entomology **3**+1	4	English	4
Horticulture **3**+1	4	Chemistry **3**+1	4	French	4
Veterinary	4	Physics	4	German	4
Botany **3**+1	4	Engineering	4	Spanish	4
Landscape gardening **3**+1	4	Floriculture **3**+1	4	Latin	4

Courses of Instruction

FOR THE DEGREES OF MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY

Applicants are eligible neither for the degree of Master of Science nor for that of Doctor of Philosophy until they have received the degree of Bachelor of Science or its equivalent.

COURSES FOR THE DEGREE OF MASTER OF SCIENCE

A course of study is offered in each of the following subjects: mathematics and physics, chemistry, agriculture, botany, horticulture, entomology, veterinary science. Upon the satisfactory completion of any two of these, the applicant receives the degree of Master of Science.

Candidates for the degree of Master of Science must devote, after graduation from college not less than one year and a half to the prosecution of two of the above courses. At least one full academic year must be passed in residence at the Massachusetts Agricultural College.

COURSES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is conferred upon candidates who shall have passed three years of graduate work in this institution and satisfactorily completed one major course of study and two minor courses. A course in botany, chemistry, entomology, or horticulture may be selected as the major. The minor courses available are those in botany, chemistry, entomology, horticulture, and zoölogy.

At least three years is necessary to complete the work required: twenty hours a week to be devoted to the major subject, and from twelve to sixteen to be given to each minor during one and a half years.

A general outline of the work assigned for the major study in each subject follows:

BOTANY. Vegetable physiology, vegetable pathology, mycology, œcology, taxonomy, phylogeny, the history of botany, and the history and theory of evolution. The above subdivisions of botany will be pursued to a greater or less extent, as may be necessitated by the previous training of the student and the nature of the original problem undertaken. In this course it is also recommended that the student take, in addition to his prescribed minor work, a brief course in the history of philosophy and psychology, which at present will have to be obtained elsewhere. Extensive reading of botanical literature, of both a general and a specific nature, will be required in certain subjects, and occasional lectures will be given. A botanical conference is held monthly wherein various new problems touching upon botanical science are considered by graduate students and the seniors who elect botany. A thesis dealing with some economic problem in plant physiology, or pathology, or in both, and containing a distinct contribution to knowledge, will also be required.

CHEMISTRY. Advanced work in the following subjects: inorganic analysis, qualitative (of the rarer elements), and quantitative; crystallography; physical chemistry; descriptive and determinative mineralogy; chemical geology; soil formation; soil physics and chemistry; gas analysis; synthetic inorganic work; chemical theory and history; general organic chemistry; special topics in organic chemistry; elementary quantitative organic analysis; proximate qualitative and quantitative organic analysis, including determination of organic radicles; organic synthesis of aliphatic and aromatic compounds; problems in chemical manufacture; recent chemistry of plant nutrition; animal physiological and pathological chemistry, including the chemistry of foods, standards for feeding of all kinds, milk and milk industries, urine and urinalysis; toxicology; insecticides and fungicides; frequent examinations on current chemical literature.

Early in the course original work on some chemical subject pertaining to agriculture must be begun. The history and results of this work must, before the awarding of the degree, be submitted in the form of a thesis containing a distinct contribution to knowledge.

ENTOMOLOGY. *General morphology of insects*: embryology: life history and transformations; histology; phylogeny and the relation of insects to other arthropods; hermaphroditism; hybrids; parthenogensis; pæpogensis; heterogamy; chemistry of colors in insects; luminosity; deformities of insects; variation; duration of life.

Œcology: dimorphism; polymorphism: warning coloration; mimicry; insect architecture; fertilization of plants by insects; instincts of insects; insect products of value to man; geographical distribution in the different faunal regions; methods of distribution; insect migrations; geological history of insects; insects as disseminators of disease; enemies of insects, vegetable and animal, including parasitism.

Economic entomology: general principles; insecticides; apparatus; special cases; photography of insects and their work; methods of drawing for illustrations; field work on insects and study of life histories; legislation concerning insects.

Systematic entomology: history of entomology, including classifications and the principles of classification; laws governing nomenclature; literature,—how to find and use it; indexing literature; number of insects in collections and existence (estimated); lives of prominent entomologists; methods of collecting, preparing, preserving, and shipping insects; important collections of insects.

Journal club: assignments of the literature on the different groups of insects to different students who report at monthly meetings summaries of all valuable journalistic articles which may have appeared during the month.

Required readings of the best articles on the various topics named above and on the different orders of insects. This reading covers from 15,000 to 20,000 pages in English, French, and German, and the candidate is examined at the close of his course on this, together with his other work.

Thesis: A thesis illustrated by drawings, consisting of the results of original investigation along one or several lines, and constituting a distinct contribution to knowledge, must be completed and accepted before the final examinations are taken.

HORTICULTURE. The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation, and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself continuously to it. He will be required to attend lectures, conferences, and seminars, dealing with horticulture in its broader aspects. Advanced work will be required in the following subjects: systematic pomology, pomological practice, commercial pomology; systematic, practical, and commercial olericulture; greenhouse plants and problems; floriculture; landscape gardening; plant breeding and general evolution; and questions of a physiological nature connected with propagation and pruning.

Other requirements and opportunities are (1) periodical seminars with special lectures by prominent men from outside the college; (2) extensive and systematically planned readings; (3) frequent visits, always with some definite purpose in view, to orchards, gardens, greenhouses, estates, and libraries outside the college grounds; (4) and finally, the preparation, and publication of a thesis which shall set forth the results of the candidate's major study, and be an original and positive contribution to horticultural knowledge.

ZOÖLOGY. This course is offered as a minor subject for candidates for the degree of Doctor of Philosophy.

General and comparative anatomy, both gross and microscopic; ontogeny and phylogeny; life cycles, metamorphosis and metagenesis; animal associations, colonial, commensal, and parasitic, and symbiotic associations of animals and plants; adaptation, adaptive radiation and parallelisms.

Geologic, geographic, and bathymetric distribution of animals.

Systematic zoölogy, including palæozoölogy; museum and field technique.

Economic zoölogy.

History and development of the zoölogical science.

Weekly seminar and journal club meetings are held, in which all advanced students of zoölogy take an active part.

Collaterial reading and a general knowledge of current zoölogical literature are required.

Short Courses

These courses are open to persons of both sexes. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is required. Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

I. DAIRY FARMING

	Hours a week
Soils, tillage, and methods of soil improvement: manures and fertilizers and their use; crops and rotations	4
Breeds and breeding of dairy stock; judging to scale of points	2
Fodders and feeding farm live stock	1
Stable construction and sanitation	1
Common diseases of stock; prevention and treatment	1
Dairy products, their general characteristics, testing	2
Chemical composition of milk and of special milk products	1
Botany	2
Horticulture	2
Entomology	3
Dairy practice, including testing, use of separators, buttermaking, preparation of certified and modified milk and pasteurization	4
Practice in horticulture	1

Begins first Wednesday in January and continues ten weeks.

II. HORTICULTURE

	Hours a week
Soils, tillage, manures, etc.	4
Plant propagation and pruning	3
General fruit growing	3
Market gardening	3
Botany	4
Entomology	3
Practice work in seed testing, seeding, grafting, budding, transplanting, judging fruit, etc.	

Begins first Wednesday in January; continues ten weeks. This course will not be given unless at least eight men register for it.

III. Bee Culture

This course begins the fourth Wednesday in May and continues two weeks, but will not be given unless applied for by at least six students.

	Total hours
The structure of bees, with special reference to their work . . Professor H. T. Fernald	3
Flowers and fruits in their relations to bees . . . . . . Professor Stone	10
Honey crops and how to grow them . . . . Professor Brooks	5
Bees and bee keepers' supplies . . . . Professor Paige	10
Work in the apiary, under direction of an expert	20
Instruction by specialists	

Equipment of the Several Departments

AGRICULTURE

The part of the college estate assigned to the department of agriculture contains 160 acres of improved land, 16 acres of pasture, and 16 acres of woodland. The latest inventions in improved agricultural tools and machinery are in practical use. The barn and stables are stocked with the best breeds of horses, cattle, sheep, and swine. Three large rooms equipped with the latest machinery driven by an electric motor are used in the instruction in dairy operation. The museum contains a collection of implements, seeds, plants, and models of animals, all of which are designed to illustrate the evolution of agriculture.

The laboratory is provided with a full line of the latest and most highly improved apparatus for the study of the physical properties and the mechanical analysis of soils. Space for the indoor study of farm-machinery in motion is provided. A dynamometer for determination of the draft of machines and implements; surveyors' instruments for use in drainage problems; and microscopes and germination apparatus for use in seed examination are among the more important accessories in this department.

HORTICULTURE AND LANDSCAPE GARDENING

For illustration of the science and the practice of horticulture, the department possesses about 100 acres devoted to orchards planted with the leading old and new varieties of

apples, pears, peaches, plums, cherries, quinces, chestnuts, hickory-nuts, and walnuts; good commercial vineyards; nurseries containing many kinds of fruit and ornamental trees, shrubs, and plants, in all stages of growth, from the seed and cuttings to those ready for planting out; and small-fruit plantations of considerable diversity and extent. Several acres of excellent garden land are devoted to the growing of all the common types of vegetables. All these plantations, as far as possible, are managed according to the best practical and commercial methods, so that students may learn to know not merely the plants themselves but the best methods of handling them at a profit.

There are large, well-stocked glass houses to illustrate the principles of greenhouse construction and management. These houses contain a large collection of the economic plants of the world, and also small commercial supplies of plants such as carnations and chrysanthemums, commonly grown for market.

A fine arboretum of trees and shrubs, native and exotic, furnishes material for the study of landscape gardening. Gardens of hardy and tender plants are being continually extended. Actual work in practical landscape gardening, laying drives and walks, planning and planting various areas, is constantly in progress on the college campus.

The work in horticulture, floriculture, and landscape gardening is now much better provided for than in the past through the completion of Wilder Hall. This contains three classrooms, three student-laboratories, a large drafting-room, and a library, besides offices, a museum, and private laboratories. The building is a substantial structure, three stories high, containing all the most modern appliances and exemplifying the best ideas in college laboratory constructions. It is practically fireproof, of red brick, terra cotta and tile.

CHEMISTRY

This department has rooms well adapted to their special uses. They are supplied with a large assortment of apparatus and chemical materials. The lecture-room on the second floor has a seating capacity for seventy students. Immediately adjoining it are four smaller rooms used for storing apparatus and preparing materials for the lecture table. The laboratory for beginners, furnished with forty working-tables, is a large room on the first floor. Each table is provided with reagents and apparatus for independent work. A well equipped laboratory for advanced work is also provided on the first floor. A weighing room has six balances and improved apparatus for determining densities of solids, liquids, and gases. The equipment includes also a microscope, a spectroscope, a polariscope, a photometer, a barometer, numerous models, etc. The various rooms are furnished with an extensive collection of industrial charts. A valuable and growing collection of specimens and samples, fitted to illustrate different subjects taught, is also provided. This includes rocks, minerals, soils, raw and manufactured fertilizers, foods, including milk products, fibers, other vegetable and animal products, and artificial preparations of mineral and organic compounds. Series of preparations are used for illustrating the various stages of different manufactures from raw materials to finished product.

GEOLOGY

Geological teaching is illustrated by a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, models, and charts.

ZOÖLOGY

Zoölogical laboratory.—A large and well lighted room, situated in the Chemical laboratory building is amply fitted with the best apparatus obtainable, consisting of microscopes both simple and compound, a microtome, a paraffin bath, an incubator, dissecting instruments and all the necessary accessory apparatus and reagents. A reference library which includes the current zoölogical and geological journals is kept in the room, and there are ample aquaria in which living forms may be studied.

Zoölogical lecture room.—An ample lecture room is situated in South College, adjacent to the museum. It is supplied with an electric projection lantern, a set of Leuckart charts, various special charts, and with a complete set of Auzoux models, illustrative of both human and comparative anatomy. A special set of typical specimens is used for class illustration, although the more extensive museum collection is drawn upon for the same purpose.

Zoölogical museum.—The museum is mainly for the purpose of exhibiting those forms treated of in the lecture and the laboratory courses, but, in addition to this, the aim has been to show as fully as possible the fauna of the Commonwealth, and those types which show the evolution and the relationship of the members of the animal kingdom. The total number of specimens contained in the museum now exceeds eleven thousand. The museum is open to the public from 3-30 to 5-30 P. M., each week day.

Entomological laboratory.—The equipment for work in entomology for seniors and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes, microtomes, reagents, and the usual laboratory implements. One portion of the building is fitted up as a lecture room.

Another room is devoted to library purposes, and contains a card-catalogue of nearly fifty thousand cards, devoted to the literature of insects. In addition to a well selected list of entomological works in this room, the college library has an unusual number of rare and valuable books on this subject. This is supplemented by the private entomological libraries of the professors in charge, which contain over twenty-five hundred volumes, many of which cannot be found elsewhere in the United States. In another room is a large and growing collection of insects; both adult and in the early stages. As the laboratory is connected with the insectary of the Hatch Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray-pumps, nozzles, and other articles for the practical treatment of insects ; the chemical room, fitted up for the analysis of insecticides, and other chemico-entomological work ; and a greenhouse, where plants infested by injurious insects are under continual observation and experimental treatment,—all these are available to the student. In addition, several private laboratory rooms and a photographing room with an unusually good equipment of cameras are provided. The large greenhouses, grounds, gardens, and orchards of the college are also to be mentioned under this head, providing for study under natural conditions as they do, a wide range of subjects relating to the attacks of injurious insects.

VETERINARY SCIENCE

The department has at its disposition a commodious and modern laboratory and a hospital-stable both erected in 1899. The buildings are constructed according to the latest ideas concerning sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation, and disinfection.

The main building contains a large working laboratory for students' use, and several small private laboratories for special work. In addition there are a lecture-hall, a museum, a demonstration room, a photographing room, and a work shop. The hospital-stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, also a section for poultry, one for cats and dogs, and six sections separated from each other, for the accommodation of horses, cattle, sheep, swine, and other domestic animals.

The laboratory equipment consists of a dissectible Auzoux model of the horse, Auzoux models of the foot and of the legs, showing the anatomy and the diseases of every part. There are skeletons of the horse, the cow, the sheep, the dog, and the pig, and, in addition, a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts, and diagrams, used for lectures and demonstrations.

The laboratories are supplied with the most modern, high-power microscopes, microtomes, incubators, and sterilizers, for the use of students taking the work in bacteriology and parasitology.

BOTANY

The botanical department possesses a general laboratory furnished with tables and benches for microscopic and physiological work and with a dark closet for photographic purposes. There are forty-six compound microscopes, thirty dissecting microscopes, a micro-photographic and landscape camera, and various accessories; also microtomes, paraffine baths, etc., for histological work; a large and useful collection of physiological apparatus for the study of photo-synthesis, respiration, metabolism, transpiration, heliotropism, and other phenomena connected with plant irritation; a set of apparatus for the study of the mechanical constituents of the soil, and for experimental work in soil texture. The laboratory is equipped with various devices for the study of mechanics of plant structure; several types of self-registering auxanometers used to measure the rate of growth of plants; self-registering thermometers, and hygrometers for recording constant changes in conditions.

Botanical lecture room.—The botanical lecture room adjoining the laboratory is adapted for general work in morphology and flower analysis and opportunity is afforded to use dissecting microscopes.

Botanical museum.—Directly over the botanical lecture room is a museum. It contains a collection of valuable material now undergoing rearrangement and enlargement. There is a collection of spraying solutions; an economic collection of seeds; the principal Masssachusetts timber trees, with photographs and sections of the same, and many cases of interesting examples of natural and artificial grafts, girdlings, etc.

Connected with the museum is an herbarium containing about 15,000 species of flowering plants and ferns, 1,200 species of mosses, 1,200 species of lichens and liverworts, and 12,000 species of fungi, the latter collection being housed in the vegetable pathology building at the experiment station.

Adjacent to the botanical laboratory and lecture room are labeled collections of native and exotic trees. The various conservatories of the college and the experiment station are also available and represent over 13,000 square feet of ground surface devoted to the cultivation of a large variety of exotic plants.

MATHEMATICS, PHYSICS, AND ENGINEERING

SURVEYING

The department possesses a considerable number of the usual surveying instruments with the use of which the students are required to become familiar by performing a stated amount of field work. Among the larger instruments are two plain compasses, railroad compass with telescope, surveyor's transit, two engineer's transits with vertical arc and level, solar compass, omnimeter with verniers reading to ten seconds, adapted to geodetic work. Queen plane table, two wye levels, dumpy level, builder's level, sextant, hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For draughting, a vernier protractor, pantograph, parallel rule, etc., are available.

PHYSICS

Among the apparatus in use for instruction in general physical processes are to be found a set of United States standard weights and measures, precision balances, spherometer, vernier calipers,.etc.; in mechanics, apparatus to illustrate the laws of falling bodies, systems of pulleys and levers, motion on an incline plane, and the phenomena connected with the mechanics of liquids and gases. The usual apparatus for lecture illustration in heat, light, and sound are also in the possession of the department. In electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, among which may be enumerated a full set of Weston ammeters, and volt meters, a Carhart-Clark standard cell, Mascart quadrant electrometer, Siemens electro-dynamometer, as well as reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistance.

MILITARY SCIENCE

In addition to a large campus, suitable for battalion drill, the military department possesses a special building in which there is a drill room 60 by 135 feet, an armory, a recitation room, an office for the commandant, and a field-gun and gallery practice room. The building has also a large bathroom immediately adjoining the armory.

In a plot of ground north of the college buildings there is a rifle range, marked for practice at distances of 100 and 200 yards. The range is furnished with a revolving target suitably protected by earthworks. The national government supplies, for the use of the department, arms and equipments: the Springfield cadet rifle and two breech-loading rifled steel guns, calibre 3.2, with complete equipments and ammunition.

The State supplies instruments for the college band.

Students are held responsible for all articles of public property while in their possession.

THE CHAPEL-LIBRARY BUILDING

One of the most attractive and commodious buildings belonging to the college is the chapel-library. It has a commanding position, approximately in the center of the group of buildings adjoining the campus. The larger part of the second story is occupied by the chapel, a large room, capable of seating about four hundred. It is used for daily prayers, the various commencement exercises, and not infrequently for lectures and social gatherings. The room has an excellent pipe organ. Two adjoining rooms are used for small religious gatherings. These rooms can be thrown open so as to become a part of the main audience hall.

The lower story is occupied by the library. This library is available for reference or for investigation, and is open daily, except on Sundays, from 8 A. M. to 5 P. M. and from 6-30 to 8-30 P. M. It is open on Sundays from 10 A. M. to 1 P. M. The volumes at present number 27,000. The library contains carefully selected books in the departments of agriculture, horticulture, botany, entomology, sociology, economics, history, literature, and the fine arts, all of which are well represented. Constant additions will be made to obtain the latest and best works in the several departments of learning.

DINING-HALL

For the convenience of students, a brick colonial dining-hall, equipped with all modern conveniences, was completed and opened in February, 1903. It is under the supervision of a committee composed of two members of the faculty, two members of the student body, and the steward.

The hall contains a number of suites of rooms which may be secured for occupancy by young women students of the college.

THE HEATING, LIGHTING, AND POWER PLANT

This plant is located in the ravine near the chemical laboratory. In addition to supplying heat and light for various college buildings, as well as lights for the college grounds, it furnishes also electric power for driving the machinery in the dairy and in the barn. Connected with the plant is a machine shop in which much practical work is done for the college. It therefore affords opportunity to students of mechanical and electrical engineering, for practical training and observation.

General Information

DORMITORIES

Students are expected to occupy rooms in the college dormiteries unless otherwise excused.

In North College and South College, rooms, unfurnished, are arranged in suites of three. Each apartment consists of one study room and two bedrooms. In North College the corner rooms are 14 by 15 feet, and the annexed bedrooms 8 by 10 feet. The inside study rooms are $13\frac{1}{2}$ by $14\frac{1}{2}$ feet, and the bedrooms 8 by 8 feet. In South College the study rooms are 14 by 15 feet with a recess $7\frac{1}{3}$ by 3 feet, and the bedrooms $11\frac{1}{6}$ by $8\frac{5}{12}$ feet. Both buildings are heated by steam and lighted by electricity.

Students are required to care for their rooms. Military inspection by the commandant takes place every Saturday morning at 8-30 o'clock.

Rent for dormitory rooms varies according to the building and the location, from $15 to $45 a year. Steam heat costs $12 yearly. Light costs $12 yearly. Board is furnished in the college dining hall at present for $3.25 a week. Rooms in the dining-hall are reserved for women who are students in any department of the college. The rent is $18 a semester; light and heat, each $12 a year.

Correspondence relative to the engaging of rooms should be addressed to Thomas Canavan, the janitor.

EXPENSES

Room rent, in advance	$15.00	$45.00
Board, $3.25 to $4 a week	117.00	144.00
Heat	12.00	12.00
Washing, 30 to 60 cents a week	11.00	22.00
Military suit	12.50	20.00
Light	12.00	12.00
Miscellaneous expenses	41.00	45.00
	$220.50	$300.00

In addition to the above expenses $120 tuition is charged to foreigners.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms for such application may be obtained from the president of the college.

The military suit must be obtained immediately upon entering college and used in the drill exercises prescribed. The following fees, payable in advance, are applied towards the maintenance of the several laboratories: chemical, $15 per semester used; zoölogical, $2 per semester used sophomore year; other classes $4 per semester; entomological, $3 per semester used. The fee for use of the botanical laboratory for one period of two hours during each week in $1 per semester. Other periods will be charged for proportionally. Some expense is also incurred for text-books. In exceptional cases incidental expenses necessitate additional charges.

THE LABOR FUND

An annual appropriation of $5000 is received from the State. The object of this fund is to assist only those students who are citizens of Massachusetts and are dependent either wholly or in part on their own exertions, by furnishing them work in the several departments of the college. The greatest opportunity for such work is found in the agricultural and the horticultural departments.

Application for participation in the benefits of the labor fund should be made to the president of the college. Students desiring to avail themselves of its benefits must bring a certificate signed by one of the selectmen of the town in which they are resident, certifying to the fact that they require aid.

ENDOWED LABOR FUND

There is available also the income of five thousand dollars, the gift of a generous friend of the college, which will be used in the payment for labor to deserving students needing assistance.

SELF-HELP

Good opportunities are afforded for partial self-support to those students who choose to avail themselves of them. But much depends upon the determination and the ability of the student applying for work. Some exceptional men have succeeded in paying their way through college. Not a few have paid a large share of their necessary expenses. Many have earned a small part of the cost of their college course. But in every case the student should have funds enough to pay his way until he can adapt himself to his new environment and show what he is capable of earning. The long summer vacation allows the student to earn good wages at home or elsewhere. There are no college exercises on Saturdays, so that work for wages may then be performed. But no student should attempt to engage in work that will interfere with his success in his studies. The labor fund is employed in paying for the labor of students who require work, but the fund is limited and the college cannot promise employment to all applicants. Each case must be determined according to the circumstances of the time and the qualifications of the man.

RELIGIOUS SERVICES

Chapel services are held every week-day except Saturday at 8 A. M. A religious meeting Thursday evening, under the auspicies of the College Young Men's Christian Association is held in the chapel. Students are expected to attend divine service on Sunday with the churches of their choice in town, where a cordial welcome is accorded them.

FELLOWSHIP

A fellowship under the title of "Instructor in Chemistry" is offered to a recent graduate who desires, in connection with his regular duties as instructor, to carry on advanced work for one or more years.

SCHOLARSHIPS

ESTABLISHED BY PRIVATE INDIVIDUALS

Mary Robinson fund of one thousand dollars, the bequest of Miss Mary Robinson, of Medfield.

Whiting Street fund of one thousand dollars, the bequest of Whiting Street, of Northampton.

Henry Gassett fund of one thousand dollars, the bequest of Henry Gassett, of North Weymouth.

The income of these funds is assigned to worthy students requiring aid.

Tuition is free to citizens of the United States. Citizens of Massachusetts however, in accordance with an act of the Legislature, must make application to the senator of the district in which they live for a free scholarship that covers the charges for tuition. Blank forms of such application may be obtained from the president of the college.

DEGREES

No honorary degrees are conferred.

Those who complete the four years course will receive the degree of Bachelor of Science. The diploma is signed by the governor of the Commonwealth as well as by the president of the college.

Those who receive this degree may receive also the degree of Bachelor of Science from Boston University, for which a fee of ten dollars is charged ; provided that the candidate in addition to the college course shall have mastered in a preparatory school a three years' preparatory course in studies beyond those commonly presented in the grammar schools of Massachusetts.

Those who complete the assigned courses will receive the degree of Master of Science for which a fee of ten dollars must be paid to the treasurer of the college.

Those who complete the three years' course of study required and present a satisfactory thesis will be granted the degree of Doctor of Philosophy. The fee for this degree is twenty-five dollars.

Those to whom degrees are awarded must present themselves in person at commencement to receive them.

Prizes

The following prizes are offered annually for proficiency in the work of several of the departments of collegiate study:

AGRICULTURE

The Grinnell prizes, the first of twenty-five dollars, and the second of fifteen dollars, given by Hon. William Claflin, of Boston, in honor of George B. Grinnell, Esq.. of New York, to those members of the senior class who produce the best and the second best examinations, oral and written, in theoretical and practical agriculture.

BOTANY

The Hills prizes of thirty-five dollars, given by Henry F. Hills of Amherst, will this year be awarded to members of the senior class as follows: fifteen dollars for the best general herbarium, ten dollars for the best collection of Massachusetts trees and shrubs, and ten dollars for the best collection of Massachusetts woods.

ENGLISH

The Flint prizes, the first consisting of thirty dollars, and the second of twenty dollars, are awarded under certain restrictions, to those members of the junior class who produce the best and the second best orations. Both composition and delivery are considered in making the award.

The Burnham prizes, amounting in all to eighty dollars, given by the late T. O. H. P. Burnham of Boston, to members of the sophomore, and the freshman class, for excellence in composition work and in declamation. Composition work, in competition for these prizes, is confined to the second semester of the sophomore year. Under certain restrictions, a first prize of twenty dollars, a second prize of ten, and a third prize of five are awarded. Declamation work, in competition for these prizes, is confined to the second semester of the freshman year. Under certain restrictions, a first prize of twenty-five dollars, and a second prize of twenty are awarded.

FORESTRY

The J. D. W. French prize of twenty-five dollars, offered by the Bay State Agricultural society to that member of the senior class who writes the best essay on Forestry.

Two prizes, a first of fifteen dollars, and second of ten dollars, are offered by a friend of the college to those members of the senior and the junior classes who write the two best essays on the management of a farm wood lot.

MILITARY DIPLOMAS

The commandant is authorized to give military diplomas, countersigned by the president of the college, to those men receiving the degree of Bachelor of Science, who by their work in the military department during their course in college have shown themselves worthy of distinction. These diplomas recommend for commissions in the United States army or in the militia of the several states, those receiving them vouching that they are fitted to fill the position of a commissioned officer.

GENERAL IMPROVEMENT

The Western Alumni association prize of twenty-five dollars, is offered to that member of the sophomore class, who during his two years in college has shown the greatest improvement in scholarship, character and example.

SPECIAL PRIZES

Special prizes are occasionally offered by various departments.

SHORT COURSE PRIZES

The Dairy prizes are given by the Massachusetts Society for Promoting Agriculture, to members of the winter short course. Two sets of prizes are offered. The first set consists of three prizes of fifty, thirty, and twenty dollars, respectively, given for general excellence in all branches of the course as offered. The second set consists of three prizes of twenty-five, fifteen, and ten dollars, respectively, for excellence in the making of butter.

Award of Prizes

1904—1905

Grinnell Agricultural Prizes—Senior

First prize: Bertram Tupper
Second prize: Harold Foss Tompson

Hills Botanical Prizes—Senior

Best general herbarium: Esther C. Cushman
Best collection of Massachusetts trees and shrubs: Esther C. Cushman
Best collection of Massachusetts woods: Chester L. Whitaker

Flint Oratorical Prizes—Junior

First prize: William Hunlie Craighead
Second prize: Ralph Ware Peakes

Burnham Composition Prizes—Sophomore

First prize: Waldo Darius Barlow
Second prize: Clinton King
Third prize: Joseph Otis Chapman

Burnham Declamation Prizes—Freshman

First prize: Thomas Francis Waugh
Second prize: Allan Dana Farrar

Military Honors—Senior

The following cadets were reported to the Adjutant General, U. S. Army, and to the Adjutant General of Massachusetts, as having shown special aptitude for military service:

George H. Allen
Edwin W. Newhall
Frederick L. Yeaw

Western Alumni Association Improvement Prize—Sophomore

Henry Tyler Pierce

Short Course in Dairy Farming

Massachusetts Society for Promoting Agriculture: for general excellence—first prize, $50, William E. Salmon; second prize, $30, Charles M. Carruth; third prize, $20, Eugen A. R. Schmitz.

Massachusetts Society for Promoting Agriculture: for highest scoring butter: first prize, $25, Cecil N. V. Greenhalgh; second prize, $15, John B. Lucia; third prize, $10, Harry R. Carter.

Massachusetts Society for Promoting Agriculture: for excellence in stock judging: first prize, $10, Morey A. Smith; second prize, $7.50, Charles M. Carruth; third prize, $5, William H. Ranney; fourth prize, $2.50, Robert E. Pomeroy.

Special prize offered by W. H. Bowker of Boston: for best knowledge of the use of fertilizers on the farm: one-half ton Stockbridge fertilizer, Eugen A. R. Schmitz.

Special prize given by B. von Herff, New York: for best knowledge of the use of fertilizers on grass lands: one ton kainite, Oliver H. Gates.

Degrees Conferred in 1905

MASTER OF SCIENCE

Smith, Elizabeth Hight	Amherst
Osmun, Albert Vincent	Brooklyn

BACHELOR OF SCIENCE

Adams, Richard Laban*†	Jamaica Plain
Allen, George Howard*†	West Somerville
Barnes, Hugh Lester*†	Stockbridge
Bartlett, Francis Alonzo*†	Belchertown
Crosby, Harvey Davis†	Rutland
Cushman, Esther Cowles*	Amherst
Gay, Ralph Preston	Stoughton
Gardner, John Joseph	Milford
Hatch, Walter Bowerman†	Falmouth
Holcomb, Charles Sheldon†	Tariffville, Conn.
Hunt, Thomas Francis†	Weston
Ingham, Norman Day†	Granby
Kelton, James Richard*†	Orange
Ladd, Edward Thorndike*†	Winchester
Lewis, Clarence Waterman*†	Melrose
Lyman, John Franklin*†	Amherst
Munson, Willard Anson*†	Aurora, Ill.
Newhall, Edwin White, Jr.†	San Francisco, Cal.
Patch, George Willard*†	Arlington Heights
Sanborn, Monica Lillian*	Salem
Sears, William Marshall†	Brockton
Swain, Allen Newman*	Dorchester
Taylor, Albert Davis*†	Westford
Tompson, Harold Foss	Jamaica Plain
Tupper, Bertram†	Barre
Walker, Lewell Seth*†	Natick
Whitaker, Chester Leland†	Somerville
Williams, Percy Frederick*†	Natick
Willis, Grenville Norcott*†	Becket
Yeaw, Frederick Loring†	Winthrop
Total	30

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*Degree of Boston University.

†Military Diploma.

Graduate Students

Back, Ernest Adna	*Florence*	96 Pleasant St.
B. Sc., Massachusetts Agricultural College, 1904		
Franklin, Henry James	*Bernardston*	96 Pleasant St,
B. Sc., Massachusetts Agricultural College, 1903		
Ladd, Edward Thorndike	*Winchester*	96 Pleasant St.
B. Sc., Massachusetts Agricultural College, 1905		
Lancaster, Walter Brackett	*Boston*	Northampton Road
A. B., Harvard, 1884. M. D., Harvard, 1889.		
Monahan, Niel Francis	*Amherst*	Mt. Pleasant
B. Sc., Massachusetts Agricultural College, 1903		
Smith, Philip Henry	*Amherst*	102 Main St.
B. Sc., Massachusetts Agricultural College, 1897		
Tower, Winthrop Vose	*Roxbury*	Mt. Pleasant
B. Sc., Massachusetts Agricultural College, 1903		
	Total	7

Special Students

Foster, Elsie Addie	*Worcester*	Fearing St.
	Total	1

Undergraduate Students

SENIOR CLASS

Carey, Daniel Henry	*Rockland*	Plant House
Carpenter, Charles Walter	*Monson*	Kappa Sigma House
Craighead, William Hunlie	*Boston*	28 North College
Filer, Harry Burton	*Palmer*	11 South College
French, George Talbot	*Tewksbury*	18 South College
Gaskill, Edwin Francis	*Hopedale*	R. J. Goldberg's
Hall, Arthur William, Jr.	*North Amherst*	North Amherst
Hastings, Addison Tyler, Jr.	*Natick*	5 Fearing St.
Hood, Clarence Ellsworth	*Millis*	4 South College
Kennedy, Frank Henry	*Ashmont*	12 South College
Martin, James Edward	*Brockton*	6 South College
Moseley, Louis Hale	*Glastonbury, Conn.*	4 South College
Mudge, Everett Pike	*Swampscott*	8 South College
Peakes, Ralph Ware	*Newtonville*	10 South College
Pray, Fry Civille	*Natick*	14 South College
Rogers, Stanley Sawyer	*Boston*	West Experiment Station
Russell, Harry Merwin	*Bridgeport, Conn.*	Insectary
Scott, Edwin Hobart	*Somerville*	Kappa Sigma House
Sleeper, George Warren	*Swampscott*	96 Pleasant St.
Strain, Benjamin	*Mt. Carmel, Conn.*	E. M. Dickinson's
Suhlke, Herman Augustus	*Leominster*	West Experiment Station
Taft, William Otis	*East Pepperell*	12 South College
Tannatt, Willard Colburn, Jr.	*Dorchester*	E. M. Dickinson's
Tirrell, Charles Almon	*Plainfield*	5 Fearing St.
Wellington, Richard	*Waltham*	10 South College
Wholley, Francis Dallas	*Cohasset*	11 South College
Wood, Alexander Henry Moore	*Easton*	Kappa Sigma House

Total 27

JUNIOR CLASS

Alley, Harold Edward	*Gloucester*	Kappa Sigma House
Armstrong, Arthur Huguenin	*Hyde Park*	Kappa Sigma House
Bartlett, Earle Goodman	*Chicago, Ill.*	116 Pleasant St.
Caruthers, John Thomas	*Madisonville, Ky.*	32 North College
Chace, Wayland Fairbanks	*Middleboro*	96 Pleasant St.
Chadwick, Clifton Harland	*Cochituate*	20 South College
Chapman, George Henry	*Wallingford, Ct.*	1 South College
Chapman, Joseph Otis	*Brewster*	3 Fearing St.
Clark, Milford Henry, Jr.	*Sunderland*	5 South College
Cutter, Frederick Augustus	*Pelham, N. H.*	16 South College
Dickinson, Walter Ebenezer	*North Amherst*	North Amherst
Eastman, Jasper Fay	*Townsend*	101 Pleasant St.
Hartford, Archie Augustus	*Westford*	96 Pleasant St.
Higgins, Arthur William	*Westfield*	R. J. Goldberg's
King, Clinton	*Dorchester*	77 Pleasant St.
Larned, Joseph Adelbert	*Amherst*	North Pleasant St.
Lincoln, Ernest Avery	*Fall River*	96 Pleasant St.
Livers, Susie Dearing	*Boston*	Dining Hall
Parker, Charles Morton	*Newtonville*	44 Pleasant St.
Peters, Frederick Charles	*Lenox*	14 South College
Pierce, Henry Tyler	*West Millbury*	Veterinary Laboratory
Shaw, Edward Houghton	*Belmont*	13 South College
Summers, John Nicholas	*Brockton*	6 South College
Thompson, Clifford Briggs	*Halifax*	14 South College
Walker, James Hervey	*Greenwich Village*	5 South College
Watkins, Fred Alexander	*West Springfield*	1 South College
Watts, Ralph Jerome	*Littleton*	East Experiment Station
Wood, Herbert Poland	*Hopedale*	Experiment Station Barn

Total 28

SOPHOMORE CLASS

Allen, Charles Francis	*Worcester*	96 Pleasant St.
Andersen, John Albert	*North Brookfield*	17 South College
Anderson, Kenneth French	*Roslindale*	26 North College
Bailey, Ernest Winfield	*Worcester*	Kappa Sigma House
Bangs, Bradley Wheelock	*Amherst*	29 Lincoln Avenue
Barry, Thomas Addis	*Amherst*	86 North Pleasant St.
Bates, Carleton	*Salem*	Kappa Sigma House
Browne, Marcus Metcalf	*Malden*	6 Nutting Avenue
Chapman, Lloyd Warren	*Naohua, N. H.*	E. H. Forristall's
Chase, Henry Clinton	*Swampscott*	66 Pleasant St.
Clark, Orton Loring	*Malden*	Mt. Pleasant
Cobb, George Robert	*Amherst*	33 Cottage St.
Coleman, William John	*Natick*	Plant House
Cummings, Winthrop Atherton	*Auburn, Cal.*	L. H. Taylor's
Curtis, Jesse Gerry	*South Framingham*	77 Pleasant St.
Cutting, Roy Edward	*Amherst*	11 High St.
Daniel, John	*Osterville*	6 North College
Davenport, Stearnes Lothrop	*North Grafton*	8 South College
Davis, Paul Augustin	*Lowell*	82 Pleasant St.
Dolan, Clifford	*Hudson*	9 Fearing St.
Eastman, Perley Monroe	*Townsend*	101 Pleasant St.
Edwards, Frank Laurence	*Somerville*	21 North College
Farley, Arthur James	*Waltham*	9 North College
Farrar, Allan Dana	*Amherst*	1 Dana St.
Farrar, Parke Warren	*Springfield*	Kappa Sigma House
Flint, Clifton Leroy	*Amesbury*	Kappa Sigma House
Gillett, Chester Socrates	*Southwick*	101 Pleasant St.
Gillett, Kenneth French	*Southwick*	17 South College
Gold, Frank Lyman	*Amherst*	14 Gray St.
Gowdey, Carlton Craig	*Bridgetown, Barbados*	116 Pleasant St.
Hayes, Herbert Kendall	*North Granby, Coun.*	101 Pleasant St.
Howe, William Llewellyn	*Marlboro*	9 South College
Hyslop, James Augustus	*Rutherford, N. J.*	5 North College
Ingalls, Dorsey Fisher	*Cheshire*	22 North College
Jackson, Raymond Hobart	*Amherst*	26 Lincoln Avenue
Jennison, Harry Milliken	*Millbury*	5 North College

Johnson, Frederick Andrew	*Westford*	7 South College
Jones, Thomas Henry	*Easton*	E. H. Forristall's
Larsen, David	*Bridgeport, Conn.*	E. Experiment Station
Liang, Lai-Kwei	*Tientsin, China*	80 Pleasant St.
Miller, Danforth Parker	*Worcester*	Kappa Sigma House
George Paige,	*Amherst*	
Parker, John Robert	*Poquonock, Conn.*	96 Pleasant St.
Philbrick, Edwin Daniels	*West Somerville*	20 South College
Reed, Horace Bigelow	*Worcester*	Professor Cooley's
Regan, William Swift	*Northampton*	84 Pleasant St.
Sawyer, William Francis	*Sterling*	77 Pleasant St.
Shattuck, Leroy Altus	*Pepperell*	66 Pleasant St.
Thurston, Frank Eugene	*Worcester*	15 South College
Turner, Olive May	*Amherst*	22 Spaulding St.
Turner, William Franklin	*Reading*	9 South College
Verbeck, Roland Hale	*Malden*	13 South College
Warner, Theoren Levi	*Sunderland*	24 North College
Waugh, Thomas Francis	*Worcester*	96 Pleasant St.
Wellington, Joseph Worcester	*Waltham*	9 North College
Wheeldon, Albert James	*Worcester*	1 Dana St.
Wheeler, Hermon Temple	*Lincoln*	24 North College
White, Herbert Linwood	*Uniontown, Ky.*	C. H. Kellogg's
Whiting, Albert Lemuel	*Stoughton*	E. H. Forristall's
Whitmarsh, Raymond Dean	*Taunton*	Kappa Sigma House
Wright, Samuel Judd	*South Sudbury*	22 North College

Total 61

FRESHMAN CLASS

Adams, William Everett	*Chelmsford Center*	82 North Pleasant St.
Alger, Paul Edgar	*Somerville*	Mr. J. Walsh's
Bardwell, Frank Raymond	*North Brookfield*	
Barnes, Benjamin Franklin, Jr.	*Haverhill*	79 Pleasant St.
Bartholomew, Persis	*Melrose Highlands*	Dining Hall
Bartlett, Oscar Christopher	*Westhampton*	Mr. J. Walsh's
Bean, Thomas Webster	*South Hadley Falls*	82 Pleasant St.
Beebe, John Cleaveland	*Hampden*	101 Pleasant St.
Bennett, Ernest Victor	*Malden*	25 North College
Bent, George Franklin	*Milton*	
Blake, Rodman Ruggles	*East Pepperell*	7 South College
Briggs, Orwell Burlton	*Egremont*	112 Pleasant St.
Brown, Eben Hermon	*Bridgewater*	Kappa Sigma House
Brown, George Murray, Jr.	*Cambridge*	5 Fearing St.
Burke, Edward Joseph	*Holyoke*	2 South College
Caffrey, Donald John	*Gardner*	3 Fearing St.
Cardin, Patricio G.	*Artemesia, Cuba*	66 Pleasant St.
Chase, Edward Irving	*Somerville*	30 North Prospect St.
Codding, George Melvin	*Taunton*	77 Pleasant St.
Coleman, Leon Nelson	*Gardner*	23 North College
Cook, Walter Arthur	*Milton*	
Corbett, Lamert Seymour	*Jamaica Plain*	27 North College
Cox, Alfred Elmer, Jr.	*Malden*	84 Pleasant St.
Cox, Leon Clark	*Boston*	15 South College
Cronyn, Theodore Reid	*Bernardston*	96 Pleasant St.
Crosby, Harold Parsons	*Lenox*	Mr. John Walsh's
Crossman, Samuel Sutton	*Needham*	10 North College
Curran, David Aloysius	*Marlboro*	Mr. J. Walsh's
Cutler, Homer	*Westboro*	North Hadley
Eddy, Roger Sherman	*Dorchester*	116 Pleasant St.
French, Horace Wells	*Pawtucket, R. I.*	2 South College
Fulton, Gordon Russell	*Lynn*	3 Fearing St.
Gates, Clarence Augustus	*Worcester*	96 Pleasant St.
Geer, Myron Francis	*Springfield*	Mr. J. Walsh's
Geer, Wayne Emory	*Springfield*	Mr. J. Walsh's
Handy, Leroy Marshall	*Worcester*	

Hathaway, Elmer Francis	*Cambridge*	87 Pleasant St.
Hayward, Warren Willis	*Millbury*	Mr. J. Walsh's
Hibbard, Myron James	*North Hadley*	
Hillman, Arthur Joseph	*Hardwick*	
Hubbard, Arthur Ward	*Sunderland*	8 North College
Ide, Warren Leroy	*Dudley*	112 Pleasant St.
Jen, Huan	*Tientsin, China*	80 Pleasant St.
Kenney, Walter James	*Lowell*	96 Pleasant St.
Knight, Harry Orrison	*Gardner*	West Experiment Station
Lambert, Marjorie Willard	*West New Brighton, N. Y.*	Dining Hall
Learned, Wilfred Hill	*Florence*	5 McClellan St.
Lindblad, Rockwood Chester	*North Grafton*	Professor Waugh's
Lull, Robert Delano	*Windsor, Vt.*	9 Fearing St.
Lyman, Arthur Densmore	*Springfield*	82 Pleasant St.
MacGown, Guy Ernestus	*South Britain, Conn.*	E. H. Forristall's
Maps, Charles Hulick	*Long Branch, N. J.*	
Martin, Nelson Lansing	*Sharon*	
Monahan, James Valentine	*South Framingham*	Mr. Goldberg's
Neale, Harold Johnson	*Worcester*	66 Pleasant St.
Noble, Harold Gordon	*Springfield*	5 East Pleasant St.
Noyes, John	*Roslindale*	27 North College
O'Donnell, John F.	*Worcester*	96 Pleasant St.
O'Grady, James Raphael	*Holliston*	6 North College
Oliver, Joseph Thomas	*Dorchester*	44 Pleasant St.
Paddock, Charles Harold	*West Claremont, N. H.*	9 Fearing St.
Parsons, Egbert Rockwell	*Lenox*	
Pearce, Ernest Edwin	*Worcester*	North Hadley
Phelps, Harold Dwight	*West Springfield*	82 Pleasant St.
Potter, Richard	*Concord*	26 North College
Putnam, Charles Sumner	*Jefferson*	101 Pleasant St.
Randolph, Lucy Amelia	*Belchertown*	
Richardson, George Tewksbury, Jr.	*Middleboro*	82 North Pleasant St.
Sexton, George Francis	*Worcester*	96 Pleasant St.
Shamiae, George Mansoor	*Damascus, Syria*	Amherst House
Smith, Alexander Halliday	*Nyack, N. Y.*	7 North College
Smulyan, Marcus Thomas	*New York, N. Y.*	11 North College
Stewart, Eri Shepardson	*Royalston*	12 North College
Strong, Anson Loomis	*Colchester, Conn.*	
Sweet, Charles Rochford	*Worcester*	96 Pleasant St.

Thompson, Myron Wood	*Halifax*	97 Pleasant St.
Thomson, Jared Brewer	*Monterey*	25 North College
Trainor, Owen Francis	*Worcester*	6 Nutting Avenue
Treat, Carlton Eddy	*Chelsea*	
Tucker, Horace Northrop	*Waterbury, Conn.*	6 Nutting Avenue
Turner, Henry William	*Trinidad, Cuba*	116 North Pleasant St.
Turner, Leroy Henry	*Pittsburg, Penn.*	
Wadsworth, Ralph Emerson	*Northboro*	
Warner, Frederick Chester	*Sunderland*	8 North College
Webb, Charles Russell	*Worcester*	66 Pleasant St.
Whaley, James Sidney	*East Orange, N. J.*	12 East Pleasant St.
Whelpley, Walter Merton	*Winthrop*	116 Pleasant St.
White, Charles Howard	*Providence, R. I.*	82 Pleasant St.
Willis, Luther George	*Melrose Highlands*	10 North College
Wilson, Frank Herbert, Jr.	*Nahant*	31 North College
	Total	90

Short Course

CLASS OF 1905

Barnes, Charles White	Haverhill
Carruth, Charles Mason	Barre
Carter, Henry Rufus	Millbury
Chase, Edward Irving	Somerville
Daniels, Francis Newell	Foxboro
Davis, Warren Henry	Great Barrington
Dearborn, Alvah Carr	Amherst
Devlin, James Francis	Whitinsville
Dunnell, David Lawson	Greenfield
Eames, William Ovid	Becket
Fabian, Benedict Sebastian	Worcester
Filer, Charles Humphrey	West Brimfield
Gaskill, Roy Frank	Hopedale
Gates, Oliver Horace	Ashburnham
Geer, Raymond	Wapping, Conn.
Greenhalgh, Cecil Norman V.	Plymouth
Guiel, Arthur Daniel	South Amherst
Haynes, Jay Freeman	North Hero, Vt.
Hollquist, Andrew Gustaf	Worcester
James, Arthur Eugene	North Ferrisburg, Vt.
Kimball, Edward Bartlett	Methuen
Lincoln, James Keyes	Barre
Lucia, John Baptiste Jr.	Middlebury, Vt.
Mann, Walter Samuel	Foxboro
May, Basil Morris	South Egremont
McCrone, Henry Richmond	Amesbury
Moore, Edwin Allyn	Weyben, Westfield
Packard, Henry Wakefield	Goshen
Pomeroy, Robert Edgar	Northampton
Ranney, William Henry	South Ashfield

Raycraft, Frank Jr.	Caldwell, N. J.
Salmon, William Everett	Boston
Schmitz, Eugen Alfons R.	Shirley
Sheridan, Walter Peter	Charlton
Smith, David French	Plymouth, N. H.
Smith, Morey Ambros	Berlin, N. Y.
Taylor, Arthur Francis	Amherst
True, Arthur Ray	Amesbury
Twitchell, Julian Phelps	Cambridge
Watley, Frank Crandall	Davenport, N. Y.
Whitney, Harvey Horace	Shrewsbury
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Vermont	4	
Rhode Island	2	
California	1	
Illinois	1	
Kentucky	1	
Pennsylvania	1	
Tennesee	1	
China	2	
Cuba	2	
Barbados	1	
Syria	1	
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Alumni Associations

ASSOCIATE ALUMNI

Founded 1874

President, Charles E. Beach, '82, West Hartford, Conn.
Secretary, James B. Paige, '82, Amherst

ALUMNI CLUB OF MASSACHUSETTS

Founded 1885

President, L. LeB. Holmes, '72, New Bedford
Clerk, Franklin W. Davis, '89, Roslindale

MASSACHUSETTS AGRICULTURAL COLLEGE CLUB OF NEW YORK

Founded 1886

President, James H. Webb, '73, New Haven, Conn.
Secretary, Alvan L. Fowler, '80, New York, N. Y.

WESTERN ALUMNI ASSOCIATION

President, A. F. Shiverick, '82, Chicago, Ill.
Secretary, Arthur B. Smith, '95, Chicago, Ill.

CONNECTICUT VALLEY ALUMNI ASSOCIATION

Founded 1902

President, WILLIAM P. BIRNIE, '71, Springfield
Secretary, H. D. HEMENWAY, '95, Hartford, Conn.

MASSACHUSETTS AGRICULTURAL COLLEGE CLUB OF WASHINGTON, D. C.

Founded 1904

President, CLARENCE B. LANE, '95, Washington, D. C.
Secretary, BERNARD H. SMITH, '99, Boston

HOME ASSOCIATION

Founded 1905

President, CHARLES F. DEUEL, '76, Amherst
Secretary, ARTHUR C. MONAHAN, '00, Montague

Class Secretaries

1871	E. E. Thompson, Worcester
1872	S. T. Maynard, Northboro
1873	C. Wellington, Amherst
1874	
1875	M. Bunker, Newton
1876	C. F. Deuel, Amherst
1877	
1878	C. O. Lovell, New Rochelle, N. Y.
1879	R. W. Swan, Worcester
1880	
1881	J. L. Hills, Burlington, Vt.
1882	G. D. Howe, Bangor, Me.
1883	S. M. Holman, Attleboro
1884	L. Smith, Springfield
1885	E. W. Allen, Washington, D. C.
1886	
1887	F. H. Fowler, Boston
1888	H. C. Bliss, Attleboro
1889	C. S. Crocker, Boston
1890	F. W. Mossman, Westminster
1891	
1892	H. M. Thomson, Thompson, Conn.
1893	F. A. Smith, Hopedale
1894	S. F. Howard, Amherst

1895	H. A. Ballou, Barbados, W. I.
1896	
1897	C. A. Peters, Moscow, Idaho
1898	S. W. Wiley, Baltimore, Md.
1899	D. A. Beaman, Porto Rico
1900	E. K. Atkins, Northampton
1901	J. H. Chickering, Dover
1902	H. L. Knight, Middletown, Conn.
1903	G. D. Jones, North Amherst
1904	P. F. Staples, Amherst
1905	P. F. Williams, Milton

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CATALOGUE

OF THE

MASSACHUSETTS
AGRICULTURAL COLLEGE

1906-1907

AMHERST
PUBLISHED BY THE COLLEGE
1907

Press of Carpenter & Morehouse,
Amherst, Mass.

Calendar for 1907-1908

1907			
January	2	Wednesday	Fall semester resumed, at 8 A. M.
February	6	Wednesday	Fall semester ends.
February	7	Thursday	Spring semester begins, at 8 A. M.
March	27	Wednesday	Spring recess begins.
April	3	Wednesday	Spring semester resumed, at 8 A. M.
May	30	Thursday	Memorial Day.
June	15	Saturday	Grinnell Prize examination of the senior class in agriculture.
June	16	Sunday	Baccalaureate address.
June	17	Monday	Burnham prize speaking. Flint Prize oratorical contest.
June	18	Tuesday	Class-day exercises. Meeting of the alumni. Reception by the President and Trustees.
June	19	Wednesday	Commencement exercises.
June	20, 21	Thursday and Friday.	Examinations for admission.
September	17, 18	Tuesday and Wednesday.	Examinations for admission.
September	19	Thursday	Fall semester begins at 8 A. M.
November	28	Thursday	Thanksgiving Day.
December	19	Thursday	Winter recess begins.
1908			
January	2	Thursday	Fall semester resumed at 8 A. M.
February	5	Wednesday	Fall semester ends.
February	6	Thursday	Spring semester begins at 8 A. M.
March	26	Thursday	Spring recess begins.
April	2	Thursday	Spring semester resumed at 8 A. M.
June	17	Wednesday	Commencement exercises.

Origin, Object and Location

The Massachusetts Agricultural College was among the first of the institutions to be established under the provisions of the national land-grant act of 1862. This act donated "public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts." The framer of this bill was the late Senator Justin Smith Morrill of Vermont. At the present time more than sixty institutions of higher learning in this country directly owe their origin or their prosperity to the benefits of this great educational measure.

The college was incorporated in 1864 by an act of the State Legislature; and on the second of October, 1867, was formally opened to an entering class of thirty-three.

In January, 1875, an arrangement was made with the authorities of Boston University, under which the college, without losing its independence, became the "School of Agriculture" of the university. By this arrangement, students of the Massachusetts Agricultural College, besides obtaining the regular diploma of the college (which is accepted by American universities and by the University of Göttingen, Germany), may, upon payment of a fee, and under certain conditions, receive the diploma in science awarded to graduates of the Boston institution. In 1882, the State Experiment Station was located on the college grounds. It has since been incorporated with the college.

The college offers a free education to any American student of good character who may fulfill the requirements for admission. Women are admitted to the courses of the institution on the same conditions as men. It offers also its courses of study to foreign students upon payment by them of a tuition fee. It gives a four years course leading to the degree of Bachelor of Science, and graduate courses leading to the degree of Master of Science and of Doctor of Philosophy. It offers also winter courses of ten weeks, and upon announcement a special course of two weeks in bee culture.

The college is situated in the beautiful town of Amherst. Its grounds are especially attractive, and comprise over 400 acres of land, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent.

Amherst, ninety-seven miles west of Boston, is on the Central Vermont railroad and the Central Massachusetts division of the Boston and Maine railroad. Electric car lines connect the village with Northampton and Holyoke.

The Corporation

	Term Expires.
NATHANIEL I. BOWDITCH, Framingham	1908
WILLIAM WHEELER, Concord	1908
ARTHUR G. POLLARD, Lowell	1909
CHARLES A. GLEASON, New Braintree	1909
JAMES DRAPER, Worcester	1910
SAMUEL C. DAMON, Lancaster	1910
MERRITT I. WHEELER, Great Barrington	1911
CHARLES H. PRESTON, Danvers	1911
CARROLL D. WRIGHT, Worcester	1912
M. FAYETTE DICKINSON, Boston	1912
WILLIAM H. BOWKER, Boston	1913
GEORGE H. ELLIS, Boston	1913
J. HOWE DEMOND, Northampton	1914
ELMER D. HOWE, Marlboro	1914

MEMBERS EX OFFICIO

His Excellency CURTIS GUILD, Jr.
Governor of the Commonwealth

KENYON L. BUTTERFIELD
President of the College

GEORGE H. MARTIN
Secretary of the Board of Education

J. LEWIS ELLSWORTH
Secretary of the Board of Agriculture

OFFICERS OF THE CORPORATION

His Excellency CURTIS GUILD, Jr. . Boston

President

CHARLES S. GLEASON . . . . Springfield

Vice-President

J. LEWIS ELLSWORTH . . . . Boston

Secretary

GEORGE F. MILLS . . . . . Amherst

Treasurer

CHARLES A. GLEASON . . . New Braintree

Auditor

Board of Overseers

STATE BOARD OF AGRICULTURE

EXAMINING COMMITTEE OF OVERSEERS

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Warren C. Jewett	Worcester
Charles H. Shaylor	Lee
Isaac Damon	Cochituate
Albert H. Nye	Blandford

H. D. Haskins - P & A. Chemistry
Dr. Lindsay
[illegible]

Faculty

✓ KENYON L. BUTTERFIELD, M.A., . . 35 Lincoln Ave.
President of the College and Professor of Rural Sociology

CHARLES A. GOESSMANN, PH.D., LL.D. . . 40 Amity St.
Professor of Chemistry

CHARLES H. FERNALD, PH.D. . . . 3 Hallock St.
Professor of Zoölogy

✓ WILLIAM P. BROOKS, PH.D. . . . . M. A. C.
Professor of Agriculture and Director of the Experiment Station

GEORGE F. MILLS, M.A. . . . . 46 Amity St.
Professor of English and Latin

✓ CHARLES WELLINGTON, PH.D. U. S. mail . . . 34 Amity St.
Associate Professor of Chemistry

✓ GEORGE E. STONE, PH.D. . . . Mount Pleasant
Professor of Botany

✓ HENRY T. FERNALD, PH.D. . . . . 44 Amity St.
Professor of Entomology

JAMES B. PAIGE, D.V.S. U. S. mail. . . 42 Lincoln Ave.
Professor of Veterinary Science

JOHN E. OSTRANDER, M.A., C.E. . 33 North Prospect St.
Professor of Mathematics and Civil Engineering

✓ FRANK A. WAUGH, M.SC. . . . . . M. A. C.
Professor of Horticulture

GEORGE C. MARTIN, CAPT. 18TH U. S. INF. Amherst House
Professor of Military Science and Tactics

Philip B. Hasbrouck, b.sc. . . 130 Pleasant St.
Associate Professor of Mathematics and Adjunct Professor of Physics

Fred S. Cooley, b.sc. . Pleasant St., North Amherst
Assistant Professor of Agriculture

S. Francis Howard, m.sc. . . . . 10 Allen St.
Assistant Professor of Chemistry

Clarence E. Gordon, m.a. . . .
Assistant Professor of Zoölogy and Geology

Robert Wilson Neal, m.a. . . . . 8 Spring St.
Assistant Professor of English and Instructor in German

Robert W. Lyman, ll.b. . . . . Northampton
Lecturer on Farm Law

F. William Rane, m.sc. . . . State House, Boston
Lecturer on Forestry

Louis R. Herrick, b.sc. . . . 2 So. Prospect St.
Instructor in French and Spanish and Secretary of the Faculty

George N. Holcomb, b. a., s. t. b. . . North Amherst
Instructor in History, Economics and Government

A. Vincent Osmun, m.sc. . . . 10 Allen St.
Instructor in Botany

Sidney B. Haskell, b.sc. . . . . Mt. Pleasant
Instructor in Agriculture

Charles G. Barnum, b.a. . . . Mt. Pleasant
Iustructor in Chemistry

Harold F. Tompson, b.sc. . . . . So. College
Instructor in Market Gardening

Henry J. Franklin, b.sc. . . . 6 Phillips St.
Instructor in Botany

Nathan J. Hunting, b.sc. . . . Shutesbury
Instructor in Dairying

CHARLES B. HALLIGAN, B.SC. . . . Wilder Hall
Instructor in Drawing

FRANCIS CANNING, ... Mt. Pleasant
Instructor in Floriculture

SHORT COURSE INSTRUCTORS

EARLE BRINTNALL, B.S. AG.
Butter Expert

E. H. FULTON
Instructor in Babcock Testing

NATHAN J. HUNTING
Instructor in Use of Separators

H. J. FRANKLIN
Instructor in Entomology

H. M. RUSSELL
Instructor in Botany

OTHER COLLEGE OFFICERS

PHILIP B. HASBROUCK, B.SC. . . . 130 Pleasant St.
Registrar

MISS GRACE M. KNOWLES, B.S. . . . . . Amherst
Secretary to the President

E. FRANCES HALL, . Leverett St., North Amherst
Librarian

ELWIN H. FORRISTALL, M.SC. . . . . M. A. C.
Superintendent of Farm

NEWTON WALLACE, ... 6 Phillips St.
Electrician

E. CHARLES ROWE, ... M. A. C.
Steward of Dining Hall

Committees of the Faculty

Instruction: Professors MILLS, OSTRANDER, WELLINGTON, WAUGH, and the REGISTRAR

Electives: Professors PAIGE, OSTRANDER, NEAL, COOLEY, and GORDON.

Athletics: Professors PAIGE, MARTIN, HOWARD, and Mr. HALLIGAN

Catalogue: Messrs. HERRICK, HOLCOMB, NEAL, and the REGISTRAR

Entrance Examinations: Professors HASBROUCK, NEAL, GORDON, and MR. HOLCOMB.

Rules: Professors HOWARD and HOLCOMB

Graduate Courses: Professors C. H. FERNALD, WELLINGTON, STONE, and H. T. FERNALD

Schedule: Professors OSTRANDER and HASBROUCK

Dining Hall: Professors MILLS and HASBROUCK

Student Relations: Professors WAUGH, PAIGE, and COOLEY

Library: Professors STONE, MILLS, H. T. FERNALD, OSTRANDER, and BROOKS

Student Work: Professors MILLS, MARTIN, and HASBROUCK

Advisory Committee on Discipline: Professors MILLS, MARTIN, and HASBROUCK

CHAIRMEN OF THE MEETINGS OF THE INSTRUCTORS OF THE SEVERAL CLASSES

Senior class: Professor H. T. FERNALD
Junior class: Professor WELLINGTON
Sophomore class: Professor COOLEY
Freshman class: Mr. HERRICK

Admission

Candidates for admission must be sixteen years old, and must present a testimonial of good character from the principal of the last school which they attended. Applicants for admission by examination should present this testimonial at the time when they report for examination.

The privileges of the College may be withdrawn from any student at any time if such action is deemed advisable.

Candidates for admission to the freshman class will be received either on certificate, as explained hereafter, or upon passing examinations.

SUBJECTS REQUIRED FOR ADMISSION*

GROUP I. LANGUAGE

Sub-Group 1. English and
Sub-Group 2. French or German.†

GROUP II. HISTORY AND CIVIL GOVERNMENT

Sub-Group 1. United States History and Civil Government.
Sub-Group 2. One of these:
  a. General history.
  b. Ancient history.
  c. Medieval and modern history.
  d. English history.

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*The requirements for admission have been lately revised. Applicants who furnish the Registrar satisfactory evidence that they were ignorant of the new requirements and have instead prepared according to the provisions of the Catalogue of 1905-1906, may be admitted. If an applicant be admitted under this exception, after failing in the subjects newly required, he will be given an opportunity to make up in course the conditions so incurred.

†Beginning 1908; see paragraph 3-4, p. 15. Examination may be taken in 1907.

GROUP III. MATHEMATICS AND SCIENCE

Sub-Group 1. Algebra, through quadratics.
Sub-Group 2. Plane Geometry.
Sub-Group 3. Two of these:
  a. Physiology.
  b. Chemistry.
  c. Solid Geometry.

This examination may be oral or written. The standard required for passing is 65 per cent in each subject.

EXPLANATION OF REQUIREMENTS

English.—In English, candidates will not be accepted whose work is notably deficient in spelling, grammatical correctness, punctuation, phraseology, or division into paragraphs. Ability to understand and interpret ordinary prose and verse is indispensable.

The examination will include (1), the answering of questions set by the examiner upon the books named below and upon matters of literary form, biography, and history relating to them, and (2), writing on a number of topics chosen from a list set by the examiner for the purpose of testing the general information of the applicants and their ability to express themselves clearly and accurately.

To meet requirement (2), a knowledge of the rudiments of rhetoric, elementary skill in composition, and a general but accurate knowledge of the substance of the assigned books are essential. To meet requirement (1), however, the applicant will need to have made a detailed and careful study of the substance, form and structure of at least half the books required. He should also be familiar with the leading facts (a), in the lives of the authors of the required books, and (b), in the literary history of the period to which they belong as it is given in introductory histories of literature.

For examination in 1907 the books will be: Shakspere's **The Merchant of Venice;* Irving's *Life of Goldsmith;* Scott's *Ivanhoe* and **The Lady of the Lake;* Tennyson's *The Princess;* Coleridge's **The Ancient Mariner;* Lowell's **The Vision of Sir Launfal;* George Eliot's **Silas Marner.*

For 1908–1909, the books will be: Shakspere's **Macbeth* and **The Merchant of Venice;* Milton's **Lycidas*, **Comus*, **L'Allegro*, and **Il Penseroso;* Webster's **First Bunker Hill Oration* with either Burke's **Speech on Conciliation* or Washington's **Farewell Address;* Tennyson's **Gareth and Lynette*, **Lancelot and Elaine*, and **The Passing of Arthur;* Ruskin's *Sesame and Lilies;* Bunyan's *Pilgrim's Progress* (Part I); Scott's *Quentin Durward;* either Macaulay's **Life of Johnson* or Carlyle's **Essay on Burns.*

French and German.—Beginning with September 1908 the College requires either Elementary French or Elementary German for admission. The ready translation of easy passages into English and a knowledge of the elements of the grammar will be expected.

Students admitted to the freshman class in September 1907 will be required to take either French or German four hours a week during the freshman year and to continue the same language three hours a week during the sophomore year. Applicants having studied either of the above languages before admission will take the one of which they have no knowledge or the one in which they are less proficient. Beginning with 1908, students admitted to the freshman class must take in college that one of the above languages not offered by them for admission.

Mathematics.—Knowledge of the principles of arithmetic is presupposed, although an examination in this subject is not usually required. Inasmuch as candidates are frequently deficient in algebra and geometry, they are urged to obtain such drill in these subjects as shall secure accuracy and readiness in the application of principles to practical examples; no student found deficient in both algebra and plane geometry will be admitted to the college.

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*Books recommended for detailed study.

TIMES AND PLACES OF EXAMINATIONS

The regular examinations for admission given in June 1907 will be held on Thursday and Friday, the twentieth and twenty-first of that month, in the following places:

The Botanic Museum of the Agricultural College, Amherst.

Jacob Sleeper Hall, Boston University, 12 Somerset Street, Boston.

Horticultural Hall, Worcester.

Pittsfield.

In September, the examinations will be held at the Botanic Museum of the Agricultural College only, and applicants wishing to take the fall examinations must report there on Tuesday and Wednesday, September 19 and 20.

The order of the examinations will be as follows in both June and September.*

FIRST DAY:	8-30 A. M.	Registration
	9-00 A. M.	Chemistry and Solid Geometry
	11-00 A. M.	United States History and Civil Government
	2-00 P. M.	Plane Geometry
	4-00 P. M.	Sub-Group 2 of Group II

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*SCHEDULE FOR EXCEPTIONAL CASES. For 1907 only: see footnote, p. 13

FIRST DAY:	8-30 A. M.	Registration
	9-00 A. M.	Physical Geography
	11-00 A. M.	Civil Government
	2-00 P. M.	Geometry
	4-00 P. M.	General History
SECOND DAY:	8-30 A. M.	Algebra
	10-30 A. M.	Physiology
	2-00 P. M.	English
	4-00 P. M.	French and German

SECOND DAY:	8-30 A. M.	Algebra
	10-30 A. M.	Physiology and Chemistry
	2-00 P. M.	English
	4-00 P. M.	Sub-Group 2 of Group I

Applicants wishing to pass off advanced work in French or German should apply to the class instructors on Friday, September 20, at 4 P. M., at the Botanic Museum.

Preliminary examinations in any of the required subjects may be taken a year before the candidate expects to enter college, the credit standing for one year thereafter.

ADMISSION ON CERTIFICATE

Certificates of such high-schools and academies as have been approved by the Faculty are accepted in place of examinations. Principals expecting to certify pupils to the college should apply to the Registrar for the necessary forms, as these blanks are furnished only to them, not to applicants. Each certificate must be signed by the principal of the school. Failure of any student to maintain a satisfactory standard of work, through lack of either ability or application, will constitute a sufficient reason under paragraph 2, page 13, for revoking the acceptance of his certificate.

ADMISSION TO ADVANCED STANDING

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter.

To meet this requirement, students transferring to this college from another college or university of recognized standing must present the following credentials:

1. A letter of honorable dismissal from the institution with which he has been connected.
2. A statement or certificate of his entrance record.

3. A statement from the proper officer showing a complete record of his work while in attendance.

4. A marked catalogue showing the courses pursued.

These credentials should be presented to the registrar at this college and will be laid by him before the proper authorities. All applications will be judged wholly on their merits, and the college may prescribe additional tests before accepting such applicants or determining the standing to be granted them.

Courses of Instruction

FOR THE DEGREE OF BACHELOR OF SCIENCE

AGRICULTURE

1. *Freshman year*, first semester, three hours a week.

Introduction. Relation of federal and state governments to agriculture, four lectures. History of agriculture, tenure of land, rents, holdings, etc., six lectures.

Animal breeding. Shaw's *Breeding Animals*, lectures and discussion of principles of breeding.

Assistant Professor Cooley

2a. *Sophomore year*, first semester, seven weeks, four exercises a week in class room. Breeds of farm live stock: sheep, cattle. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.* Assistant Professor Cooley

2b. *Sophomore year*, first semester, nine weeks, four exercises a week in class room. Horses and swine. Lecture syllabus by Cooley, and Curtis' *Horses, Cattle, Sheep and Swine.*

Assistant Professor Cooley

3a. *Sophomore year*, second semester, eight weeks, three hours a week. Dairying. Lectures on dairy farming, milk production, handling and marketing of milk, milk preservation and modification, and products of milk. Text-book, Wings' *Milk and Its Products.* Assistant Professor Cooley

3b. *Sophomore year*, second semester, ten weeks. Soils: formation, classification, composition; physical and chemical characteristics, and their relations to maintenance and increase productiveness. Brooks' *Agriculture*, Vol. I, supplemented by in lectures and laboratory work. Mr. Haskell

4a. *Junior year*, first semester, ten weeks, elective. Methods of soil improvement, including tillage, drainage, and irrigation. Brooks' *Agriculture*, Vol. I, supplemented by lectures, laboratory work, and practical exercises. Mr. HASKELL

4b. *Junior year*, first semester, four weeks, elective. Manures; production, composition, properties, adaptation and use. Brooks' *Agriculture*, Vol. II, supplemented by lectures and practical exercises. MR. HASKELL

4c. *Junior year*, first semester, four weeks, elective. Stock judging. Assistant Professor COOLEY

5. *Junior year*, second semester, elective. Fertilizers, including a critical study of their production, composition, properties, adaptation and use ; and green manuring. Brooks' *Agriculture*, Vol. II, supplemented by lectures, laboratory work and practical exercises. Professor BROOKS and Mr. HASKELL

6a. *Senior year*, first semester, four weeks, four hours a week, elective. Silos and ensilage ; historical development ; the merits and methods of construction of the different kinds of silos ; the crops suited for ensilage ; ensilage machinery ; the methods of filling the silo ; and the nature and extent of the changes taking place in ensilage as affecting food value. Lectures, books of reference, and practical exercises.

Professor BROOKS

6b. *Senior year*, first semester, seven weeks, four hours a week, elective. Dairying : selection and management of the dairy farm, dairy cattle, chemical and physical properties of milk, etc., cream, butter, cheese, and by-products.

Assistant Professor COOLEY

6c. *Senior year*, first semester, four exercises a week for seven weeks. Dairy practice ; use of separators, Babcock tester, butter making, etc. SPECIALISTS

6d. *Senior year*, first semester, five weeks, four hours a week, elective. Feeding animals ; principles of digestion and animal nutrition, a study of feeding stuffs (coarse and concentrated). The relation of food to product ; compounding rations. Armsby's *Cattle Feeding*, lectures and discussion.

Assistant Professor COOLEY

7a. *Senior year*, second semester, elective. The crops of the farm and crop rotation ; including a study of the origin and agricultural botany of all the leading crops of the farm ; annual forage crops, grasses and legumes, cereals, root-crops, vegetables, tobacco and other special commercial crops. The production and uses of each ; the varieties and methods of improvement ; the adaptation to soil ; the special manurial requirements ; and the methods of raising and harvesting are considered. Lectures, reference books, and field work.

Professor BROOKS

7b. *Senior year*, second semester, elective. Agricultural experimentation ; objects, methods, sources of error ; interpretation of results. Lectures, and study of reports, bulletins, etc.

Professor BROOKS

7c. *Senior year*, second semester, elective. Farm management ; selection of the farm, its subdivision and equipment, buildings, fences, roads, water supply; farm capital, permanent, perishable and floating. The labor of the farm and its management ; farm power and farm machinery. Lectures and practical exercises.

Professor BROOKS

Seminar courses, by arrangement, for advanced students.

Special problems requiring experiment or other research investigation will be assigned to students fitted for and desiring such work. There will, when desired, be given by special arrangement, training and practice in the use of farm implements and machines.

BACTERIOLOGY

The instruction in bacteriology is given by means of lectures, recitations and laboratory exercises. The object of this course of study is to acquaint the student with the various organisms found in air, water, soil, milk, and the body, and their relation to such processes as decomposition, fermentation, digestion, and production of disease. The toxic substances resulting from the growth of organisms are considered, as well as the antitoxins used to counteract their action.

Senior year, first half of the first semester, six laboratory exercises of two hours each a week. Required.

Professor PAIGE

BOTANY

The object of the course in Botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. The undergraduate work extends through six semesters. The first two semesters are required. An outline of the course follows:

1. *Freshman year*, first semester, five hours a week. Laboratory work and lectures. Histology and physiology of the higher plants. This includes a study of the minute structure of the plant organism, such as stems, roots, leaves, seeds, etc., together with their functions and their chemical and physical properties. This course extends into the next semester.

Mr. OSMUN

2. *Freshman year*, second semester, three hours a week. Laboratory work, lectures, and text-book. Outlines of classification and morphology of the higher plants. This course follows the preceding one, and commences about the first of March. It is devoted to a study of the relationship of plants, their gross structure, together with extensive individual practice in flower

analysis. An herbarium of 100 species is required of each student. Mr. OSMUN

3. *Junior year*, first semester, five hours a week, two laboratory exercises and one lecture period a week. Cryptogamic botany. This includes a study of the lower forms of plant life necessary for a comprehension of the succeeding courses.
Mr. OSMUN

4. *Junior year*, second semester, five hours a week, two laboratory exercises and one lecture period a week. Elements of vegetable pathology and physiology. This course includes a study of the common fungus diseases of crops, and consideration of methods of prevention and control. The function of plants as related to susceptibility to disease is also taken up. All of the junior botany is included in four of the junior elective courses. Professor STONE

5-6. *Senior year*, elective, both semesters, three laboratory exercises and one lecture period a week. (a) Plant physiology. (b) Plant pathology. Both courses are optional and are adapted to students who desire a more detailed knowledge of plant diseases and plant physiology. Extensive use is made of the valuable and constantly increasing experiment station literature. Professor STONE

CHEMISTRY

The courses aim to inculcate accurate observation, logical thinking, and systematic and constant industry, together with a comprehensive knowledge of the subject. Instruction is given by text-book, lecture, and a large amount of laboratory work under adequate supervision. The laboratory work at first consists of a study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by a quantitative analysis of salts, minerals, soils, fertilizers, and animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest, such as the production of sugar, starch, and dairy commodities; the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders and foods; and the analysis of soils, waters, milk, wine, and other animal and vegetable products. The courses are as follows:

1. *Freshman year*, second half of second semester, four hours a week. General chemistry, Part 1, principles of chemistry, non-metals. Newth's *Inorganic Chemistry*.
Assistant Professor Howard

2. *Sophomore year*, first semester, six hours a week. General chemistry, Part 2, metals. Assistant Professor Howard

3. Second semester, five hours a week. Subject continued, dry analysis. Assistant Professor Howard

4. *Junior year*, first semester, eight hours a week. Qualitative and quantitative analysis, organic chemistry. Four hours a week; special subject. Professor Wellington

5. Second semester, ten hours a week. Organic chemistry. Remsen's *Organic Chemistry*. Five hours a week; special subject. Professor Wellington

6. *Senior year*, first semester, (a) three hours a week. Chemical industries. Professor Goessmann

(b) Eight hours a week; quantitative analysis and physical chemistry. Reychler-McCrae's *Physical Chemistry*.
Professor Wellington and Assistant Professor Howard

7. Second semester, eight hours a week. Advanced work, with lectures. Professor Wellington

ENGLISH

The department English aims to give : (a) Facility in written and oral expression of thought in correct, effective English ; (b) acquaintance with masterpieces of American and English literature ; (c) the special ability to present, logically and forcibly, oral and written arguments on propositions assigned for debate.

The following courses are offered : Under (a), Rhetoric and Oratory ; under (b), Introductory Literature, American Literature, and English Literature ; under (c), Argumentation. The elective course in the senior year is in language and literature.

REQUIRED COURSES

1. *Rhetoric and Introductory Literature.* This course extends through the two semesters of the freshman year and the second semester of the sophomore year, and correlates with course 3.

A. *Rhetoric.* Beginning with the first semester of the freshman year, frequent themes and written exercises are required, some to be prepared in the class-room and some outside. A text-book is used to supplement the work in composition. In the freshman year the text used is a handbook such as Genung's *Outlines of Rhetoric* or Pearson's *Principles of Composition.* The work of the second sophomore semester is a continuation of this course and (in part) of the course in American Literature, the latter course furnishing some of the topics for composition. Course 3 may itself be given as a development of Course 1.

The object of the composition work is to enable students to order and express their thoughts readily, and individual instruction and criticism are therefore given as much as conditions permit.

B. *Literature.* In conjunction with the work in composition, students are required to read a number of books, to be announced from time to time. Written studies of these books are required, usually at intervals of two weeks; they are based upon some elementary manual of criticism or directed by the instructor. Lectures may be given explaining or applying the principles of criticism. Assistant Professor NEAL

2. *Oratory.* Individual drill in declamation, first in private and then before the class, is given during the second semester of the freshman year. The choice of speakers for the Burnham prizes is based upon this work. In the junior year, during the first semester, at least two orations are written upon subjects assigned or chosen, and delivered before the class. Every oration is criticised by the instructor before it is committed to memory by the student. The choice of speakers for the Flint prizes in oratory is based upon this work.

Professor MILLS and Assistant Professor NEAL

3. *American Literature.* American literature—three hours a week, first semester—is required in the sophomore year. It correlates with the study of literature done in the freshman year, and in part with the composition work of that year and of the second sophomore semester. The first object of the course is to give students direct personal acquaintance with the works of the leading men of American letters, and outside reading is therefore regularly assigned. On this reading, frequent written exercises are required, usually in the class-room. These studies are based upon directions from the instructor or upon a manual of criticism. Reference to standard histories of American literature (such as Newcomer's, Wendell's, Bronson's, Trent's) is made for biographical and historical detail, and further information may be supplied by lecture.

Assistant Professor NEAL

4. *English Literature.* The history of English literature is studied during the second semester of sophomore year, four hours a week. The work is based upon a text-book; this year Newcomer's *English Literature* will be used. The topical method is followed in recitation, and instead of formal lectures, there are discussions of points requiring a fuller development than the text-book gives. Collateral readings of literature are required. Frequent written tests are given in which particular attention is paid to the definition of words used in the text-book and to the use of English in the development of the topics unfolded in the text-book or discussed in the class-room.

Professor MILLS

5. *Argumentation.* Four hours a week during the first semester of the junior year are given to written and oral argumentation. The course is outlined as follows: (a) Principles of argumentation as laid down in a text-book or by lecture; (b) briefs and brief-making; (c) briefs developed into forensics and submitted for personal criticism; (d) debates.

Professor MILLS

ELECTIVE COURSE

6. Senior elective course, two semesters, four hours a week. The work in this course is upon the following subjects: (a) English language, its origin, history, and development, with particular attention to the study of words as outlined in Anderson's *A Study of English Words*; (b) English literature, principally of the eighteenth and nineteenth centuries.

Professor MILLS

ENTOMOLOGY

A knowledge of insects is of importance in every department of life and particularly in connection with agriculture, horticulture, biology, landscape gardening and forestry, as well as part of a general educaton. An introductory course in this subject is therefore given in the junior year. For those who desire a further knowledge of the subject because of its importance to their future occupations, a senior course is also offered, so arranged as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry, or science teaching, as life occupations, the work being largely individual with each student.

1. *Junior year*, elective, second semester, three exercises of two hours each a week. One lecture a week. Lectures, laboratory, and field work; general consideration of the structure and life histories of insects; systematic study of the groups of insects with particular reference to those of economic importance; methods for preventing or checking their ravages; insecticides and apparatus for their use; the collecting, mounting, and naming of insects, and examination of the work of insects in the field and laboratory.

Professor H. T. Fernald

2. *Senior year*, elective, for those who have had the junior work; first and second semesters, three laboratory exercises of two hours each a week. One lecture a week. Lectures, laboratory and field work; advanced morphology of insects; economic entomology; training in the determination of insects; use of literature on entomology; study of the life histories of insects; value and application of insecticides; thesis on insects most closely related to future occupation of the student.

Professors C. H. Fernald and H. T. Fernald

FORESTRY

The act passed by the General Court of 1904 establishing the office of state forester directed that one of the duties of this officer should be to give annually a course of lectures on forestry at the Massachusetts Agricultural College. This course was given for the first time during the spring semester, 1905. It consists of lectures on the general principles of forestry, the formation and the regeneration and exploitation of forests, with special attention to farm forestry and the management of small wood lots. The lectures are accompanied by a number of field exercises in the college wood lot and in nearby forests. The whole is under the charge of the State Forester, Prof. F. Wm. Rane, in direct co-operation with the Horticultural department of the college.

GEOLOGY

1. Mineralogy, *Junior year*, second semester, six weeks, three hours a week. A course of systematic determinative mineralogy based on Brush's *Manual*. This work is carried on in the laboratory and consists in determining the minerals by a study of lustre, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests.

Assistant Professor Howard

2. Geology, *Junior year*, second semester, twelve weeks, three hours a week. Structural, dynamical, physiographical, and historical, based upon Scott's *Introduction to Geology*. The course aims to give a review of the physical condition of the earth; the various dynamic agencies and the results of their activities; the origin and the structure of rocks; and finally, the geological history of the globe and the appearance in time and the development of the principal races of animals and plants. Specimens in the museum, lantern slides, and the geologic formations of the classic Connecticut Valley afford ample means for illustration.

Assistant Professor Gordon

HISTORY, ECONOMICS AND GOVERNMENT

The aim of this department is to introduce the student to such studies as may enable him to fulfill his social and political duties. In all work of the department, the text-book and lecture systems are combined.

HISTORY

History is given four hours a week during the second semester of the freshman year. The history of England is studied to the reign of Henry VIII, then the history of England and the American colonies in conjunction to 1783, and thereafter the history of England and of the United States. Emphasis is laid on social and industrial history, but the more important political and religious movements are also treated in the lectures. Cheyney's *Social and Industrial History of England* and Coman's *Industrial History of the United States* are used as text-books. Required. Mr. HOLCOMB

ECONOMICS

The course in Economics is given for four hours a week during the first semester of the junior year. Fetter's *Principles of Economics* is used as a text, with reference-reading and Taylor's *Introduction to Agricultural Economics.* Lectures are given to supplement these books.

Such subjects as the resources of the various geographical divisions of our country in land and labor, the application of division of labor to agriculture, specialized and diversified farming, the large and the small farm system, tenure of farm lands, the distribution of farm products, tendencies toward agricultural coöperation, and those characteristics of agriculture which make it especially attractive to the liberally educated mind, are briefly treated. Special papers, on subjects selected from an assigned list, are required of the individual students. Elective. Mr. Holcomb

GOVERNMENT

The course in Government occupies four hours a week during the last half of the first semester and all of the second semester of the senior year. Lacock's *Elements of Political Science* and Woodburn's *The American Republic* are used as text-books. The lectures treat of the English origins of American political institutions, the constitutional history of Massachusetts, laws relating to Massachusetts towns and town officers, the constitutional history of the United States, and the history of our political parties, with special studies of eminent political leaders and interpreters of the constitution. A study is also made of the United States Department of Agriculture, State Boards of Agriculture, and governmental provisions for agricultural education. Required. Mr. Holcomb

HORTICULTURE

This department endeavors to give the student a working knowledge of horticulture on its practical and on its scientific side. The attempt is made to inculcate a taste and an enthusiasm for horticultural pursuits, in place of distaste and dislike for the drudgery of farm life. On these things success and further progress chiefly depend.

The courses now offered are as follows; others will be added as occasion requires:

REQUIRED COURSE

1. *Sophomore class*, second semester. The fundamental operations of horticulture—propagation, pruning and cultivation—as related to the physiology of the plant. During the first half of this course Bailey's *Nursery Book* is used as a text.
Mr. Halligan

ELECTIVE COURSES

2. *Junior year*, first semester, pomology. This semester is devoted to a thorough study of the practice of fruit growing. Text-books, reference-books, laboratory and field exercises are all used. This course is open only to those who have passed Course 1. Professor WAUGH

3. *Junior year*, second semester, four periods a week. Market gardening, including the raising of vegetables and small fruits. Locations, soils, methods of cultivation and marketing. Text-book, Bailey's *Principles of Vegetable Gardening*, lectures, and field exercises. This course is open only to those who have passed Course 1. Mr. TOMPSON

4. *Senior year*, general horticulture, a special review of pomology, and a course of lectures in plant breeding, four hours a week. This course is open only to those who have passed Courses 1 and 2. Professor WAUGH

5. *Senior year*, floriculture. The construction and management of frames and glasshouses, greenhouse and florists' crops, exhibiting, scoring, judging, etc. Text-book, lectures, and practical exercises, four hours weekly. Mr. CANNING

6. Individual problems will be assigned to seniors who elect horticulture. This gives the student an opportunity for specialization in various departments of fruit growing, vegetable culture, greenhouse management, and landscape gardening.
Professor WAUGH, Mr. TOMPSON, and Mr. CANNING

A seminar, made up of all students electing advanced work in horticulture, floriculture or landscape gardening, meets weekly for discussion. Successful and noted horticulturists from outside the college are frequently present to speak on the topics with which they are especially associated.

LANDSCAPE GARDENING

The college wishes especially to promote the work in landscape gardening. The aim of the courses now offered is to give the general student an understanding of the fundamental principles of design and of good taste as applied to gardening, and to prepare advanced students for the practice of landscape gardening in its various branches.

A variety of work is available in connection with the courses here definitely offered.

ELECTIVE COURSES

1. *Junior year*, first semester, three periods a week. Materials. This course is designed to give the student an intimate acquaintance with the trees, shrubs, and other plants used in landscape gardening. It is open only to those who have passed Horticulture 1.

Professor Waugh and Mr. Canning

2-3. *Junior year*, first and second semesters, four hours a week. Elements of landscape design. The principles underlying the artistic development of parks, estates, gardens, and other areas, with simpler applications of principle to actual conditions. This course is open only to those who have passed Horticulture 1, and should be accompanied by Landscape Gardening, Course 1.

Professor Waugh and Mr. Halligan

4-5. *Senior year*, first and second semesters, four laboratory periods a week. Advanced landscape gardening. Lectures, conferences, field exercises, and extensive practice work, with criticism. The student is given definite problems to solve, these problems being arranged in such an order as to develop the subject logically in the student's mind. The course is open only to those who have passed Horticulture 1 and Landscape Gardening, 1 and 2.

Professor Waugh and Mr. Halligan

MATHEMATICS, PHYSICS AND ENGINEERING

This department has charge of the instruction in mathematics, physics, civil engineering, and drawing. The aim is to secure thorough work in the fundamental principles and train the mind in clear and logical thinking. The application of the subjects to practical problems is given special attention. The work of the department extends over the four years as outlined below. Courses 1, 2, 5, 6, and 9 are required. Some other courses are required of students taking work in specified departments.

MATHEMATICS

1. *Freshman year*, first semester, five hours a week. Higher algebra, including ratio and proportion, progressions, binomial theorem, series, undetermined coefficients, logarithms, continued fractions, permutations. Wells' *College Algebra*.

Professor Hasbrouck

2. Second semester, two hours a week. (a) Solid geometry, Wells' *Solid Geometry*. Professor Hasbrouck

(b) Plane trigonometry, two hours a week. Bowser's *Plane and Spherical Trigonometry*. Professor Hasbrouck

3. *Junior year*, for mathematical and chemical students, first semester, four hours a week. Analytic geometry of the line, circle, conic sections, and higher plane curves. Wentworth's *Analytic Geometry*. Professor Ostrander

4. Second semester, four hours a week. Differential and integral calculus. Osborne's *Calculus*. Professor Ostrander

PHYSICS

5. *Sophomore year*, first semester, four hours a week. Elementary mechanics of solids, liquids and gases, heat, and sound. Dana's *Elementary Mechanics*, Carhart's *University Physics*. Professor HASBROUCK

6. Second semester, four hours a week. Electricity, magnetism, and light. Carhart's *University Physics*.
Professor HASBROUCK

7. *Senior year*, elective for those students who have taken junior mathematics. First semester, four hours a week. Analytic mechanics. Peck's *Analytic Mechanics*.
Professor HASBROUCK

8. Second semester, four hours a week. Laboratory work.
Professor HASBROUCK

CIVIL ENGINEERING AND SURVEYING

9. *Sophomore year*, second semester, two exercises of two hours a week. Plain surveying with field work, including the use of the usual surveying instruments. Text-book and lectures. Professor OSTRANDER

10. Instruction in civil engineering will be given in two distinct courses of one year each, the courses alternating. They will be open to students of the junior and senior classes as indicated below. The course for 1906-7 is planned for students in mathematics only. First semester, three hours of recitation and two hours of draughting a week; stresses in roofs, bridges and graphic statics. Merriman and Jacoby's *Roofs and Bridges*, Parts I and II.

11. Second semester, four hours a week. Strength of materials. Slocum and Handcock's *Strength*.
Professor OSTRANDER

12. The course for 1907-8 will be required of juniors and seniors taking the courses in mathematics and landscape gardening.

First semester, Hydraulics and Sanitary Engineering. Text-book and lectures. Professor OSTRANDER

13. Second semester, three hours recitation or lectures and two hours field work or draughting a week. Topographic and higher surveying, highway construction, the measurement of earthwork, pavements and railroad construction. Text-book and lectures. Professor OSTRANDER

DRAWING

14. *Junior year*, first semester, two two-hour sessions a week for students in mathematics and landscape gardening; free hand drawing. Mr. HALLIGAN

15. Second semester, two two-hour sessions a week. Mechanical and topographic drawing. Mr. HALLIGAN

MILITARY SCIENCE AND TACTICS

In compliance with the provisions of an act of Congress of July 2, 1862, military instruction under a regular army officer detailed for this purpose, is required of all able-bodied male students. Men are excused from attendance upon the exercises of this department only upon presentation of a surgeon's certificate, given by a resident physician. Minor physical disabilities which might be a bar for enlistment in the regular service or the organized militia are not to be considered; ability to perform the work required in the Cadet Corps is the only determining factor. Any student who may be excused from military duty for reasons above stated may be required to select such other work as shall be deemed by the Faculty equivalent to the military work omitted.

The object of this instruction is to disseminate clearly the elements of military knowledge throughout the country, whereby, in case of sudden emergency, a sufficient number of trained, educated men may be found, able to properly command and instruct volunteer troops. Military drill also has the object in view of giving the student physical exercise, of teaching him to respect and to obey those in authority, without detracting from pride of manhood, and of developing a military bearing and courtesy becoming in a citizen as in a soldier.

In order further to stimulate in colleges the study of military science, the War Department issued General Orders No. 101, dated Washington, D. C., June 29, 1905, as follows:

"The reports of the regular inspections of the colleges and schools to which officers of the army are detailed, in pursuance of law, as principals or instructors, will annually hereafter be submitted to the General Staff for its critical examination, and the chief of staff will report to the Secretary of War, from the institutions which have maintained a high standard, the six institutions whose students have exhibited the greatest interest, application and proficiency in military training and knowledge. The President authorizes the announcement that an appointment as second lieutenant in the regular army will be awarded to an honor graduate of each one of the six institutions, provided sufficient vacancies exist after caring for the graduates of the military academy at West Point and the successful competitors in the annual examination of enlisted men.

By order of the Secretary of War,

[Signed] ADNA R. CHAFFEE,

Lieutenant General, Chief of Staff."

Absences and excuses from practical instruction and all offences of a purely military nature and those of which the military instructor may take cognizance, as bearing on the military discipline of cadets, shall be dealt with by him in accordance with the regulations of the department, which regulations are made and promulgated by the military instructor, subject to the approval of the president of the college as executive. Delinquencies in theoretical instruction not strictly military in their nature shall be dealt with in accordance with the standing rules of the faculty.

The cadets in the graduating class who have shown special aptitude for military service are reported to the military secretary of the United States army and to the Adjutant General of the Commonwealth of Massachusetts. In making appointments from civil life, to the regular or volunteer army, preference is given to those who have their names so recorded. The names of the three most distinguished are published in the Official Register of the United States army.

The course of instruction has special reference to the duties of the officers of the line, and aims particularly to familiarize all members of the senior class with the paper work of a company. In the accomplishment of this end, utilization is made of the various blanks that the War Department issues to the college.

Each cadet is furnished with a copy of the cadet regulations governing the military department, approved by the president of the college, and is required to familiarize himself with them and to conform strictly with their requirements.

Assignments to the band are made by the military instructor. Practice in the band is credited, through the military department, in lieu of drill and theoretical instruction, subject to the provisions of the cadet regulations, with which strict conformity is required. The purpose of the cadet band is to foster and encourage among the cadets a love for patriotic national airs and martial music.

A dark blue uniform, old army pattern, costing about $15.00, is worn by all cadets when on military duty, and may be worn at other times. The uniforms are procured through an authorized tailor, and are made in the best manner of thoroughly good material. Cadets are required to be in uniform by the 15th day of October.

The sale of old uniforms to members of an entering class is prohibited, unless the consent of the military instructor is obtained.

Course I. Freshman year.

(a) Practical instruction in infantry drill regulations through the school of the battalion in close and extended order. Advance and rear guards. Outposts. Marches. Ceremonies. Guard duty. Target practice, gallery and on the range. Three exercises a week.

(b) Theoretical instruction in infantry drill regulations, to include the school of the company, manual of guard duty, small arms firing regulations. One exercise a week.

Upon the conduct and proficiency of this year depends the appointment of corporals for the ensuing year.

Captain MARTIN

Course II. Sophomore year.

Practical instruction as before. Pointing, aiming and sighting drills. Litter drills and first aid to the injured by detachments. Target practice in the gallery and on the range. Three exercises a week.

Corporals are appointed from this class—on their conduct and proficiency depends the appointment of sergeants in the next class.

Course III. Junior class.

(a) Practical instruction as before. Infantry target practice; in the gallery and on the range. Three exercises a week.

Sergeants are appointed from this class. On their conduct and proficiency depends their selection as officers for the ensuing year. When necessary, officers will also be appointed from this class. Captain MARTIN

Course IV. Senior class.

(a) Practical instruction as before. Conduct of drills of lower classes. Perform the duties of their office and practice those of higher rank. Three exercises a week.

(b) Theoretical instruction in infantry drill regulations, to include the school of the battalion, advance and rear guards, outposts, marches and ceremonies. Field service regulations. Preparation of reports, returns, muster rolls, enlistment and discharge papers, rosters, requisitions, etc. Army regulations. Lectures on military science. One exercise a week.

Officers will be taken from this class. Captain MARTIN

MODERN LANGUAGES

FRENCH

Course I. Requires four hours a week for both semesters of the freshman year. The special aim of this course is to enable the student to lay the foundation of an ability to read modern French fluently, special reference being had to scientific journals and treatises. The object of the grammar drill is to give not only instruction in the broader and more general topics, but also a thorough drill in the idiomatic peculiarities of the language, a thorough comprehension of which is held to be absolutely essential to a correct and accurate translation. Great stress is laid upon the acquisition of a good vocabulary and absolute accuracy in translation is insisted upon. The course is further strengthened by drill in pronunciation, exercises and composition, and, in general, in whatever tends to increase interest, facility and ability in accurate sight translation.

Mr. Herrick

Course II is given upon demand as a supplement to Course I, and is elective for both semesters of the senior year, for four hours a week. Its aim primarily is to furnish by an additional year's training, a greater practical proficiency in translation than can be attained merely by the completion of Course I; and secondarily, to equip the student with a general knowledge of scientific French literature. Constant advanced drill is furnished along the general lines of Course I, with the object of attaining such mastery of the language that it may be easily used as a tool in scientific pursuits and investigations of any nature. Mr. Herrick

Students who have not attained a good rank in Course I are not encouraged to elect Course II.

Though the main object of both courses is practical, a general attempt is constantly made by the comparison of French and English; by occasional lectures on French life and customs (Course II) to interest the student in the study and better comprehension of the genius of his own language and to encourage a desire for a broad and general culture.

Students entering the freshman class in 1907 or thereafter will be subject to the provisions of paragraphs 2–3, p. 15.

SPANISH

Spanish is given at present as an elective for four hours a week during both semesters. This course is open as a regular study to seniors and to freshmen who upon entering college have passed off French or German (Course I), and also as an extra to any student in good and regular standing. It is offered in response to the recognized demand in Spanish-speaking countries for graduates of agricultural colleges who have made a specialty of Agriculture, Entomology, Horticulture, Engineering, etc. Students planning future fields of work in such countries are thus enabled to acquire sufficient facility in reading, writing and speaking the Spanish language to start there to best advantage. The earlier work is based upon some such grammar as Marion and Garrennes' *Introducción á la Lengua Castellana*. The course is strengthened by writing from dictation, and by the reading of books characteristic of modern Spanish life and customs. Mr. HERRICK

GERMAN

Course I. Required three hours a week in each semester of the sophomore year. The course aims to give an understanding of the rudiments of the grammar, ability to pronounce the language, and facility in translation.

Assistant Professor NEAL

Course II. Elective four hours a week throughout the senior year. The first object of the course is to increase the reading ability of the students, especially in scientific German. Attention given to grammar, composition, and conversation will have this end chiefly in view. Students electing the course must have had high standing in Course I, or otherwise give evidence of their ability to take the course profitably.

Assistant Professor NEAL

Students admitted to the freshman class in 1907 and thereafter will be subject to the provisions of paragraphs 2–3, p. 15.

VETERINARY SCIENCE

The course of instruction in veterinary science has been arranged to meet the demands of students, who, after graduation, purpose following some line of work in practical agriculture. Particular stress is laid upon matters relating to the prevention of disease in animals. In addition, the interests of prospective students of human and comparative medicine have been taken into account in the arrangement of the course of study. The subject is taught by lectures, laboratory exercises, demonstration, and clinics.

Senior year. (a) First semester, four hours a week, elective. Veterinary hygiene, comparative (veterinary) anatomy, general pathology. Professor PAIGE

2. Second semester, four hours a week. Veterinary materia medica and therapeutics ; theory and practice of veterinary medicine ; general, special and operative surgery ; veterinary bacteriology and parasitology ; medical and surgical clinics. Professor PAIGE

ZOÖLOGY

1. Anatomy and physiology, *Freshman year*, one-half of the second semester, four hours a week. A lecture course based upon Martin's *The Human Body*, advanced course, supplemented by demonstrations from the charts and models and from microscopic and other preparations. It is possible in a comparatively brief period to review the main features of human anatomy, the generally accepted views concerning the physiology of the various organs, and the more essential laws of health. Aside from the practical value of knowledge of hygienic laws, the knowledge of the human system thus gained aids greatly in the zoölogical work to come. Assistant Professor GORDON

2. Zoölogy, *Sophomore year*, first semester, two periods a week. This is mainly a laboratory course, the aim being to familiarize the student with the structure of a number of typi-

cal forms, representive of the chief phyla of the animal kingdom, to train him to more precise habits of observation, and to lay the foundation for a more thorough understanding of laboratory technique. Lectures, amply illustrated by specimens, charts, and lantern slides, supplement and render orderly the knowledge gained in the laboratory.

Assistant Professor GORDON

3. Zoölogy, *Junior year*, four periods a week. A course in comparative morphology and systematic zoölogy based upon Parker and Haswell's *Text-book of Zoölogy*. Opportunity is given for the careful dissection of each of the typical forms, or its equivalent, described in the text, with a further series of animals for comparative study. Special attention is paid to individual and racial development, adaptation, relationship of animals to one another and to plants, geological and geographical distribution of animals, and the economic importance of the different groups, except the insects, both living and extinct. The lectures are illustrated from the very complete museum collection.

Assistant Professor GORDON

Advanced Courses of Instruction

GIVEN FOR THE DEGREES OF MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY

Applicants are eligible neither for the degree of Master of Science nor for that of Doctor of Philosophy until they have received the degree of Bachelor of Science or its equivalent.

COURSES FOR THE DEGREE OF MASTER OF SCIENCE

A course of study is offered in each of the following subjects: mathematics and physics, chemistry, agriculture, botany, horticulture, entomology, veterinary science. Upon the satisfactory completion of any two of these, the applicant receives the degree of Master of Science.

Candidates for the degree of Master of Science must devote, after graduation from college, not less than one year and a half to the prosecution of two of the above courses. At least one full academic year must be passed in residence at the Massachusetts Agricultural College.

COURSES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is conferred upon candidates who have passed three full years of graduate work in this institution and satisfactorily completed one major course of study and two minor courses. A course in botany, chemistry, entomology, or horticulture may be selected as the major. The minor courses available are those in botany, chemistry, entomology, horticulture, and zoölogy.

At least three years is necessary to complete the work required; twenty hours a week to be devoted to the major subject, and from twelve to sixteen to be given to each minor during one and a half years.

A general outline of the work assigned for the major study in each subject follows:

BOTANY. Vegetable physiology, vegetable pathology, mycology, œcology, taxonomy, phylogeny, the history of botany, and the history and theory of evolution. The above subdivisions of botany will be pursued to a greater or less extent, as may be necessitated by the previous training of the student and the nature of the original problem undertaken. As a supplement to this course it is also recommended that the student take, in addition to his prescribed minor work, a brief course in the history of philosophy and psychology, which at present will have to be obtained elsewhere. Extensive reading of botanical literature, of both a general and a specific nature, will be required in certain subjects, and occasional lectures will be given. A botanical conference is held monthly wherein various new problems touching upon botanical science are considered by graduate students and the seniors who elect botany. A thesis dealing with some economic problem in plant physiology, or pathology, or in both, and containing a distinct contribution to knowledge, will also be required.

CHEMISTRY. Advanced work in the following subjects: inorganic analysis, qualitative (of the rarer elements), and quantitative; crystallography; physical chemistry; descriptive and determinative mineralogy; chemical geology; soil formation; soil physics and chemistry: gas analysis; synthetic inorganic work; chemical theory and history; general organic chemistry; special topics in organic chemistry; elementary quantitative organic analysis; proximate qualitative and quantitative organic analysis, including determination of organic radicles; organic synthesis of aliphatic and aromatic compounds; problems in chemical manufacture; recent chemistry of plant nutrition; animal physiological and pathological chemistry, including the chemistry of foods, standards for feeding of all kinds, milk and milk industries, urine and urinalysis; toxicology; insecticides and fungicides; frequent examinations on current chemical literature.

Early in the course original work on some chemical subject pertaining to agriculture must be begun. The history and results of this work must, before the awarding of the degree, be submitted in the form of a thesis containing a distinct contribution to knowledge.

ENTOMOLOGY. *General morphology of insects*: embryology; life history and transformations; histology; phylogeny and the relation of insects to other arthropods; hermaphroditism; hybrids; parthenogenesis; pædogenesis; heterogamy; chemistry of colors in insects; luminosity; deformities of insects; variation; duration of life.

Œcology: dimorphism; polymorphism; warning coloration; mimicry; insect architecture; fertilization of plants by insects; instincts of insects; insect products of value to man; geographical distribution in the different faunal regions; methods of distribution; insect migrations; geological history of insects; insects as disseminators of disease; enemies of insects, vegetable and animal, including parasitism.

Economic entomology: general principles; insecticides; apparatus; special cases; photography of insects and their work; methods of drawing for illustrations; field work on insects and study of life histories; legislation concerning insects.

Systematic entomology: history of entomology, including classifications and the principles of classification; laws governing nomenclature; literature,—how to find and use it; indexing literature; number of insects in collections and in existence (estimated); lives of prominent entomologists; methods of collecting, preparing, preserving, and shipping insects; important collections of insects.

Journal club: assignments of the literature on the different groups of insects to different students who report at monthly meetings summaries of all valuable articles which may have appeared during the month.

Required readings of the best articles on the various topics named above and on the different orders of insects. This reading covers from 15,000 to 20,000 pages in English, French, and German, and the candidate is examined at the close of his course on this, together with his other work.

Thesis: A thesis illustrated by drawings, consisting of the results of original investigation along one or several lines, and constituting a distinct contribution to knowledge, must be completed and accepted before the final examinations are taken.

HORTICULTURE. The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation, and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself continuously to it. He will be required to attend lectures, conferences, and seminars, dealing with horticulture in its broader aspects. Advanced work will be required in the following subjects: systematic pomology, pomological practice, commercial pomology; systematic, practical, and commercial olericulture ; greenhouse plants and problems ; floriculture ; landscape gardening ; plant breeding and general evolution ; and questions of a physiological nature connected with propagation and pruning.

Other requirements and opportunities are (1), periodical seminars with special lectures by prominent men from outside the college ; (2), extensive and systematically planned readings ; (3) frequent visits, always with some definite purpose in view, to orchards, gardens, greenhouses, estates, and libraries outside the college grounds ; and (4), the preparation and publication of a thesis which shall set forth the results of the candidate's major study, and be an original and positive contribution to horticultural knowledge.

Zoölogy. This course is offered as a minor subject to candidates for the degree of Doctor of Philosophy.

General and comparative anatomy, both gross and microscopic : ontogeny and phylogeny ; life cycles, metamorphosis and metagenesis ; animal associations, colonial, commensal, and parasitic, and symbiotic associations of animals and plants; adaptation, adaptive radiation and parallelisms.

Geologic, geographic, and bathymetric distribution of animals.

Systematic zoölogy, including palæozoölogy ; museum and field technique.

Economic zoölogy.

History and development of the zoölogical science.

Weekly seminar and journal club meetings are held, in which all advanced students of zoölogy take an active part.

Collateral reading and a general knowledge of current zoölogical literature are required.

SYNOPSIS OF COURSES OF INSTRUCTION

The figures indicate the number of exercises a week: light-faced type, recitation periods of one hour each; heavy-faced type, laboratory periods of two hours each.

FRESHMAN YEAR

First Semester

Language	English	2
	French or German	4
Mathematics	Algebra	5
Science	Agriculture	4
	Botany **2**+1	3
Military	Tactics	1
		—19

Second Semester

Language	English	4
	French or German	4
Mathematics and Science	Trigonometry	**2**
	Botany	2
	One of this group:	**2**
	(a) Anatomy and physiology	
	(b) Chemistry	
	(c) Solid geometry	
History		4
		—18

SOPHOMORE YEAR

First Semester

Language	English	3
	French or German	3
Physics		4
Science	Agriculture	4
	Chemistry	**3**
	Zoölogy **1**+1	2
		—19

Second Semester

Language	English	4
	French or German	3
Physics		4
Surveying		**2**
Science	Agriculture 2+**1**	3
	Chemistry **2**+1	3
	Horticulture	3
		—22

JUNIOR YEAR

First Semester

The following subjects are required:

Economics	4
English	4
	—8

From the following each student must elect four subjects, or enough to make a total of not less than 19 nor more than 22 periods weekly. All such elections must be made subject to the exigencies of the schedule and the approval of the faculty. Subjects marked * run throughout the year.

*Agriculture	4	*Botany	3
*Chemistry	3	Pomology	4
Arboriculture	4	*Zoölogy	4
Analytical Geometry	4	*Engineering	4
Drawing	2	*Landscape Gardening	4

Second Semester

The following subjects are required:

Geology	3
Rural Sociology	2
	—5

From the following each student must elect four or five subjects, or enough to make a total of not less than 19 nor more than 22 periods weekly. All such elections must be made subject to the exigencies of the schedule and the approval of the faculty. *Full-year subjects* *elected in the first semester must be included among the electives of the second semester*, nor can full-year subjects be elected in the second semester unless they have already been taken during the first semester, except by special permission from the instructor for the second semester.

Agriculture	4	Botany	3
Chemistry	4	Market Gardening	4
Landscape Gardening	4	Entomology	4
Zoölogy	3	Calculus	4
Special Chemistry	5	Engineering	4
Drawing	2		

SENIOR YEAR

First Semester

The following subjects are required in all courses:

Bacteriology, half semester, **4**, }
Government, half semester, 4, } 4
Military science 1
—5

Second Semester

Government 4
Military science 1
—5

From the following, the student must elect three courses, closely correlated with his junior year course. Only one course in language may be elected.

Agriculture	4	Entomology **3+1**	4	English	4
Horticulture **3+1**	4	Chemistry **3+1**	4	French	4
Veterinary	4	Physics	4	German	4
Botany **3+1**	4	Engineering	4	Spanish	4
Landscape gardening **3+1**	4	Floriculture **3+1**	4	Latin	4

Short Courses

These courses are open to persons of both sexes. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is required. Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

I. DAIRY FARMING

	Hours a week
Soils, tillage, and methods of soil improvement: manures and fertilizers and their use; crops and rotations	4
Breeds and breeding of dairy stock; judging to scale of points	2
Fodders and feeding farm live stock	1
Stable construction and sanitation	1
Common diseases of stock; prevention and treatment	1
Dairy products, their general characteristics, testing	2
Chemical composition of milk and of special milk products	1
Botany	1
Horticulture	2
Entomology	3
Dairy practice, including testing, use of separators, buttermaking, preparation of certified and modified milk, and pasteurization	4
Practice in horticulture	1

Begins first Wednesday in January and continues ten weeks.

II. BEE CULTURE

This course, when given, begins the fourth Wednesday in May and continues two weeks, but is not offered this year.

	Total hours
The structure of bees, with special reference to their work Professor H. T. FERNALD	3
Flowers and fruits in their relations to bees Professor STONE	5
Honey crops and how to grow them Professor BROOKS	5
Bees and bee keepers' supplies Professor PAIGE	10
Work in the apiary, under direction of an expert	20
Instruction by specialists	

Equipment of the Several Departments

AGRICULTURE

The part of the college estate assigned to the department of agriculture contains 160 acres of improved land, 16 acres of pasture and a 16 acre woodlot. The new barn, stables and farm dairy are models in arrangement and convenience and illustrate the best possible methods of sanitation. They are stocked with the best breeds of horses, cattle, sheep, and swine. The latest inventions in improved agricultural tools and machinery are in practical use. The general management is that of the modern dairy farm. The farm illustrates upon a commercial scale the best methods of crop production and the maintenance of soil fertility, and in addition is to a considerable degree devoted to demonstration experiments upon a large scale. It has been brought to a high degree of productiveness and is capable of carrying a stock of one hundred cattle, thirty horses and colts, and seventy-five head each of sheep and swine, besides annually affording for sale from twenty-five to fifty tons of hay, two to three thousand bushels of potatoes, one thousand bushels of onions and numerous other products in smaller quantities.

Three large rooms equipped with the latest machinery driven by an electric motor are used in the instruction in dairy operations. The museum contains a collection of implements, seeds, plants, and models of animals, all of which are designed to illustrate the science and practice of agriculture.

The laboratory is provided with a full line of the latest and most highly improved apparatus for the study of the physical properties and the mechanical analysis of soils. Space is provided for the indoor study of farm-machinery in motion. A dynamometer for determination of the draft of machines and implements, surveyors' instruments for use in drainage problems, and microscopes and germination apparatus for use in seed examination, are among the most important accessories in this department.

BOTANY

The botanical department possesses a general laboratory furnished with tables and benches for microscopic and physiological work and with a dark room for photographic purposes. There are forty-six compound microscopes, thirty dissecting microscopes, a micro-photographic and landscape camera, and various accessories ; also microtomes, paraffine baths, etc., for histological work; a large and useful collection of physiological apparatus for the study of photo-synthesis, respiration, metabolism, transpiration, heliotropism, and other phenomena connected with plant irritation ; and a set of apparatus for the study of the mechanical constituents of the soil, and for experimental work in soil texture. The laboratory is equipped with various devices for the study of the mechanics of plant structure ; several types of self-registering auxanometers used to measure the rate of growth of plants; self-registering thermometers and hygrometers for recording constant changes in conditions.

Botanical lecture room.—The botanical lecture room adjoining the laboratory is adapted for general work in morphology and flower analysis and opportunity is afforded to use dissecting microscopes.

Botanical museum.—Directly over the botanical lecture room is a museum. It contains a collection of valuable material now undergoing rearrangement and enlargement. It includes a collection of spraying solutions ; an economic collection of seeds ; photographs and sections of the principal Massachusetts timber trees together with many cases of interesting examples of natural and artificial grafts, girdlings, etc.

The equipment of the museum includes an herbarium containing about 15,000 species of flowering plants and ferns, 1,200 species of mosses, and 1,200 species of lichens and liverworts. A collection of 12,000 species of fungi is housed in the vegetable pathology building at the experiment station.

Adjacent to the botanical laboratory and the lecture room are labeled collections of native and exotic trees. The various conservatories of the college and the experiment station are also available and cover over 13,000 square feet of ground surface devoted to the cultivation of a large variety of exotic plants.

CHEMISTRY

This department has rooms well adapted to their special uses. They are supplied with a large assortment of apparatus and chemical materials. The lecture-room on the second floor has seats to accomodate seventy students. Immediately adjoining it are four smaller rooms used for storing apparatus and preparing materials for the lecture table. The laboratory for beginners, furnished with forty working-tables, is a large room on the first floor. Each table is provided with reagents and apparatus for independent work. A well equipped laboratory for advanced work is also provided on the first floor. The weighing room has six balances and improved apparatus for determining densities of solids, liquids, and gases. The equipment includes also a microscope, a spectroscope, a polariscope, a photometer, a barometer, and numerous models. The various rooms are furnished with an extensive collection of industrial charts. A valuable and growing collection of specimens and samples, fitted to illustrate the different subjects taught, is also provided. This includes rocks, minerals, soils, raw and manufactured fertilizers, foods, milk products, fibers, various other vegetable and animal products, and artificial preparations of mineral and organic compounds. Series of preparations are used for illustrating the various stages of different manufactures from raw material to finished product.

ENTOMOLOGY

Entomological laboratory.—The equipment for work in entomology for seniors and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes, microtomes, reagents, and the usual laboratory implements. One portion of the building is fitted up as a lecture room. Another portion is devoted to library purposes, and contains a card-catalogue of nearly fifty thousand cards, devoted to the literature on insects. In addition to a well selected list of entomological works in this room, the college library has an unusual number of rare and valuable books on this subject. This is supplemented by the private entomological libraries of the professors in charge, which contain over twenty-five hundred volumes, many of which cannot be found elsewhere in the United States. In another room is a large and growing collection of insects, both in the adult and in the early stages. As the laboratory is associated with the insectary of the College Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray-pumps, nozzles and other articles for the practical treatment of insects; the chemical room, fitted up for the analysis of insecticides, and for other chemico-entomological work; and a greenhouse, where plants infected with injurious insects are under continual observation and experimental treatment,—all these are available for the student. In addition are provided several private laboratory rooms and a photographing room with an unusually good equipment of cameras. The large greenhouses, grounds, gardens, and orchards of the college provide for the study under natural conditions of a wide range of subjects relating to injurious insects.

GEOLOGY

Geological teaching is illustrated by a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, and by models and charts.

HORTICULTURE AND LANDSCAPE GARDENING

For the illustration of the science and practice of horticulture, the college possesses 100 acres devoted especially to orchards. This tract is planted with the leading old and new varieties of apples, pears, peaches, plums, cherries, quinces, chestnuts, hickory-nuts, and walnuts; good commercial vineyards; nurseries containing many kinds of fruit and ornamental trees, shrubs, and plants, in all stages of growth, from the seed and cuttings to those ready for planting out; and small-fruit plantations of considerable diversity and extent. Several acres of excellent garden land are devoted to the growing of all the common types of vegetables. All these plantations, as far as possible, are managed according to the best practical and commercial methods, so that students may learn to know not merely the plants themselves but the best methods of handling them at a profit.

There are large, well-stocked glass-houses to illustrate the principles of greenhouse construction and management. These houses contain a large collection of the economic plants of the world, and also small commercial supplies of plants such as carnations and chrysanthemums, commonly grown for market.

A fine arboretum of native and exotic trees and shrubs, furnishes material for the study of landscape gardening. Gardens of hardy and tender plants are being continually extended. Actual work in practical landscape gardening, laying drives and walks, and planning and planting various areas, is constantly in progress on the college campus.

The work in horticulture, floriculture, and landscape gardening is excellently provided for in the equipment of the new Wilder Hall. This contains three class-rooms, three student laboratories, a large drafting room, and a library, besides offices, a museum, and private laboratories. The building is a substantial structure, three stories high, containing all the most modern appliances and exemplifying the best ideas in college laboratory construction. It is practically fireproof, of red brick, terra cotta and tile.

MATHEMATICS, PHYSICS AND ENGINEERING

SURVEYING

This department possesses a considerable number of the usual surveying instruments, with the use of which the students are required to become familiar by performing a stated amount of field work. Among the larger instruments are two plain compasses, a railroad compass with telescope, a surveyor's transit, two engineer's transits with vertical arc and level, a solar compass, an omnimeter with verniers reading to ten seconds, adapted to geodetic work, a Queen plane table, two wye levels, a dumpy level, a builder's level, a sextant, a hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For drafting, a vernier protractor, a pantograph, a parallel rule, etc., are available. A Fairbanks-cement testing outfit is used in the course in Strength of Material.

PHYSICS

Among the apparatus in use for instruction in general physical processes are to be found a set of United States standard weights and measures, precision balances, a spherometer, vernier calipers, etc.; in mechanics, systems of pulleys and levers, apparatus to illustrate the laws of falling bodies, of motion on an inclined plane, and the phenomena connected with the mechanics of liquids and gases. The department is equipped with the usual apparatus for lecture illustration in heat, light and sound. In electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, including a full set of Weston ammeters and volt meters, a Carhart-Clark standard cell, a Mascart quadrant electrometer, and a Siemens electro-dynamometer, as well as reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistances.

The physics department will occupy the former Botanic Museum when the new botanic building is completed.

MILITARY SCIENCE.

In addition to a large campus, suitable for battalion drill, the military department possesses a special building in which there is a drill room 60 by 135 feet, an armory, a recitation room, an office for the commandant, and a field-gun and gallery practice room. The building has also a large bathroom immediately adjoining the armory.

The national government supplies, for the use of the department, the Krag-Jorgensen rifle with complete equipments and ammunition.

The state supplies instruments for the college band.

Students are held responsible for all articles of public property while in their possession.

VETERINARY SCIENCE.

The department has at its disposal a commodious and modern laboratory and a hospital-stable, both erected in 1899. The buildings are constructed according to the latest ideas concerning sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation, and disinfection.

The main building contains a large working laboratory for students' use, and several small private laboratories for special work. In addition there are a lecture-hall, a museum, a demonstration room, a photographing room, and a work shop. The hospital-stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a section for poultry, and one for cats and dogs, and six sections, separated from each other, for the accommodation of horses, cattle, sheep, swine, and other domestic animals.

The laboratory equipment consists of a dissectible Auzoux model of the horse, and Auzoux models of the foot and of the legs, showing the anatomy and the diseases of every part. There are skeletons of the horse, the cow, the sheep, the dog, and the pig, and, in addition, a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts, and diagrams, used for lectures and demonstrations.

The laboratories are supplied with the most modern high-power microscopes, microtomes, incubators, and sterilizers, for the use of students taking the work in bacteriology and parasitology.

ZOÖLOGY.

Zoölogical laboratory.—A large and well lighted room, situated in the Chemical laboratory building, is amply fitted with the best apparatus obtainable, consisting of microscopes both simple and compound, a microtome, a paraffine bath, an incubator, dissecting instruments and all the necessary accessory apparatus and reagents. A reference library which includes the current zoölogical and geological journals is kept in this room, and there are ample aquaria in which living forms may be studied.

Zoölogical lecture room.—An large lecture room is situated in South College, adjacent to the museum. It is supplied with an electric projection lantern, a set of Leuckart charts, various special charts, and a complete set of Auzoux models, illustrative of human and comparative anatomy. A special set of typical specimens is used for class illustration, and the more extensive museum collection is drawn upon for the same purpose.

Zoölogical museum.—The museum is mainly for the purpose of exhibiting those forms treated of in the lecture and the laboratory courses, but, in addition to this, the aim has been to show as fully as possible the fauna of the Commonwealth, and those types which show the evolution and the relationship of the members of the animal kingdom. The total number of specimens contained in the museum now exceeds eleven thousand. The museum is open to the public from 3-30 to 5-30 P. M., each week day.

General Information

TUITION.

Tuition is free to citizens of the United States; but citizens of Massachusetts must, in accordance with an act of the Legislature, make application to the senator of the district in which they live for a free scholarship in place of tuition charges. Blank application forms many be obtained from the President of the college. Persons not citizens of the United States pay $120 a year.

DEGREES

Those who complete the four years course will receive the degree of Bachelor of Science. The diploma is signed by the Governor of the Commonwealth as well as by the President of the college. Those who receive this degree may also, upon payment of a ten-dollar fee, receive the degree of Bachelor of Science from Boston University (see paragraph 3, p. 5); but the candidate, must meet conditions imposed by the University concerning preparatory studies.

Advanced students who complete the assigned courses will receive the degree of Master of Science. The fee is ten dollars. Credit may sometimes be allowed toward this degree for teaching or in other advanced work done in some department of the college.

Advanced students who complete the required three-years course of study and present a satisfactory thesis will be granted the degree of Doctor of Philosophy. The fee is twenty-five dollars.

Those to whom degrees are awarded must present themselves in person at commencement to receive them. No honorary degrees are conferred.

FELLOWSHIP

A teaching fellowship under the title of "Instructor in Chemistry" is offered to a recent graduate who desires to do advanced study.

SCHOLARSHIPS

INCOME ON FUNDS GIVEN BY PRIVATE PERSONS.

Mary Robinson fund of one thousand dollars, the bequest of Miss Mary Robinson, of Medfield.

Whiting Street fund of one thousand dollars, the bequest of Whiting Street, of Northampton.

Henry Gassett fund of one thousand dollars, the bequest of Henry Gassett, of North Weymouth.

These income scholarships are assigned to worthy students requiring aid.

DORMITORIES

Students are expected to occupy rooms in the college dormitories unless excused. The rooms are unfurnished.

In North College and South College rooms are arranged in suites of three—one study room and two bedrooms. In North College the corner rooms are 14 by 15 feet, and the bedrooms 8 by 10 feet. The inside study rooms are $13\frac{1}{2}$ by $14\frac{1}{2}$ feet, and the bedrooms 8 by 8 feet. In South College the study rooms are 14 by 15 feet with a recess $7\frac{1}{3}$ by 3 feet, and the bedrooms $11\frac{1}{6}$ by $8\frac{5}{12}$ feet. Both buildings are heated with steam and lighted with electricity.

Students are required to care for their rooms. Military inspection by the commandant takes place at 8-30 every Saturday morning.

Rent for dormitory rooms varies from $15 to $45 a year. Steam heat costs $12 yearly. Light costs $12 yearly. In the building, which contains the college dining hall, are the rooms reserved for women students. The rent is $18 a semester ; light and heat, each $12 a year.

Correspondence relative to the engaging of rooms should be addressed to Thomas Canavan, janitor.

EXPENSES

Tuition, see p. 63.		
Room rent, in advance,	$15.00	$45.00
Board, $3.25 to $5 a week,	117.00	180.00
Heat,	12.00	12.00
Washing, 30 to 60 cents a week,	11.00	22.00
Military uniform,	12.50	20.00
Light,	12.00	12.00
Miscellaneous expenses,	41.00	45.00
	$220.50	$336.00

A military uniform must be obtained immediately upon entering college. Fees, payable in advance, are charged as follows for the use of the several laboratories : Chemical, $15 a semester ; zoölogical, $2 a semester for the sophomore year, $4 a semester for other years ; entomological, $3 a semester. The fee for the use of the botanical laboratory for one period of two hours each week is $1 a semester. Other periods will be charged for in proportion. Laboratory fees are charged only for the semesters in which the student uses the laboratory.

The cost of text-books should also be considered. Board in the college commons at present costs $3.25 a week. At private tables, the cost ranges from $4 to $5 a week. In exceptional cases incidental expenses necessitate additional charges.

THE LABOR FUND

An annual appropriation of $5,000 for labor is received from the State. This fund is used only in assisting students who are citizens of Massachusetts and dependent either wholly or in part on their own exertions. Such students may be employed in some department of the college. The most work is needed in the agricultural and horticultural departments. Application for such employment should be made to the president of the college. Applicants must bring a certificate signed by one of the selectmen of the town in which they reside, that they require aid.

ENDOWED LABOR FUND

The income of $5,000—an anonymous gift—is also used for the employment of deserving students who need assistance.

SELF-HELP

Students find good opportunities for earning money without relying on the labor funds, but self-support depends much upon the determination and ability of the student. Some exceptional men have paid their way through college ; not a few have paid a large share of their expenses ; many have earned a small part of the cost of their course. But every student should have money to pay his way until he can adapt himself to his new environment and establish himself at work. In the long summer vacation, capable students can earn good wages at home or elsewhere. There are no college exercises on Saturdays, and Saturdays are therefore free for work.

But no student should undertake work that will interfere with his studies; and those who think of applying for employment from the labor fund must consider that the funds are small and that the college cannot promise large payments nor the employment of all applicants. Each case must be determined by itself. Students who are without resources will scarcely be able to continue their college course while supporting themselves, unless they are exceptionally able.

RELIGIOUS SERVICES

Chapel services are held every week-day except Saturday at 8 A. M. A religious meeting under the auspicies of the College Young Men's Christian Association, is held in the chapel each Thursday evening. Students are expected to attend church service on Sunday at the church of their choice in town, where a cordial welcome is accorded them.

BUILDINGS

The Chapel-Library Building.—One of the most attractive buildings belonging to the college is the chapel-library. It stands commandingly in the group of buildings adjoining the campus. The larger part of the second story is occupied by the large chapel, a room which seats about four hundred and is the general assembly room for college exercises. It contains an excellent pipe organ. Two adjoining rooms which can be thrown open as a part of the main hall, are used for smaller gatherings.

The lower story is occupied by the library. The library is open daily, except on Sundays, from 8 A. M. to 5 P. M. and from 6-30 to 8-30 P. M. On Sundays it is open from 10 A. M. to 1

P. M. The steadily growing library now contains 27,000 selected books in the departments of agriculture, horticulture, botany, entomology, sociology, economics, history, literature, and the fine arts.

Dining Hall.—A brick colonial building, equipped with the modern conveniences of a dining-hall, was completed and opened in February, 1903. It is under the supervision of a committee composed of two members of the faculty, two members of the student body, and the steward. The hall contains a number of suites of rooms which are reserved for women students.

Heating, Lighting and Power.—The College supplies its own light, heat, and power, including electricity for the night-lighting of the campus and its approaches. The machinery of the barn, the dairy, and other buildings is operated by electricity generated at the power-house. The college has also a machine-shop. Students in mechanical and electrical engineering find employment and practice in the shop and power house.

STUDENT ORGANIZATIONS

The *College Chemical Club* was organized to bring students of chemistry into closer relationship. Each member is required to read an original paper at least once a year. Seminars are held and outside speakers are invited to address the club and to discuss with the chemistry class whatever questions may come up in their work in the class-room.

The students maintain an *Esperanto Club*, intended not only for those who are learning Esperanto, but also for those who already command the language. The club plans a number of addresses to be given in the course of the year by linguists who are interested in the new speech.

The *Musical Organizations* comprise the student orchestra, a mandolin club, and a double quartet glee-club. These organizations are under the supervision of the Faculty ; they plan definite direction of the musical interest and ability among the students. A limited number of entertainments outside of Amherst are given. A military band is maintained as part of the cadet-corps.

The *Stockbridge Club* is an organization of students specially interested in practical agriculture, horticulture, and floriculture. Regular meetings are addressed by outside speakers and members present papers and engage in discussions.

Prizes

The following prizes are offered annually for proficiency in the work of several of the departments of collegiate study :

AGRICULTURE

The Grinnell prizes, the first of twenty-five dollars, and the second of fifteen dollars, given by Hon. William Claflin, of Boston, in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who produce the best and the second best examinations, oral and written, in theoretical and practical agriculture.

BOTANY

The Hills prizes of thirty-five dollars, given by Henry F. Hills of Amherst, will this year be awarded to members of the senior class as follows : Fifteen dollars for the best general herbarium, ten dollars for the best collection of Massachusetts trees and shrubs, and ten dollars for the best collection of Massachusetts woods. But no collection deemed unworthy of a prize will be considered by the judges.

ENGLISH

The Flint prizes, the first consisting of thirty dollars, and the second of twenty dollars, are awarded under certain restrictions, to those members of the junior class who produce the best and the second best orations. Both composition and delivery are considered in making the award.

The Burnham prizes, amounting to eighty dollars, given by the late T. O. H. P. Burnham of Boston, are awarded to members of the sophomore or the freshman class, for excellence in composition work and in declamation. Composition work, in competition for these prizes, is confined to the second semester of the sophomore year. Under certain restrictions, a first prize of twenty dollars, a second prize of ten, and a third prize of five are awarded. Declamation work, in competition for these prizes, is confined to the second semester of the freshman year. Under certain restrictions, a first prize of twenty-five dollars, and a second prize of twenty are awarded.

ENTOMOLOGY

Professional entomologists among the alumni of the college offer two prizes for the best work done in entomology by undergraduates. The prizes, twenty and ten dollars, are awarded by the department of entomology according to a scale of points announced in advance.

FORESTRY

The J. D. W. French prize of twenty-five dollars, is offered by the Bay State Agricultural Society to that member of the senior class who writes the best essay on Forestry.

Two prizes, a first of fifteen dollars, and second of ten dollars, are offered by a friend of the college to those members of the senior and the junior classes who write the two best essays on the management of a farm wood lot.

GENERAL IMPROVEMENT

The Western Alumni Association prize of twenty-five dollars, is offered to that member of the sophomore class, who during his two years in college has shown the greatest improvement in scholarship, character and example.

SHORT COURSE PRIZES FOR 1907.

There are no prizes offered permanently to members of the short winter course, but through the generosity of individuals, two prizes are offered for the year 1907: 1, for the best essay on the use of fertilizers on the dairy farm, one-half ton of Stockbridge fertilizer, offered by the Bowker Fertilizer Company; 2, for the best essay on the use of fertilizers for grasslands, with special reference to potash, one ton of kainit, offered by B. von Herff, of the German Kali Works, New York City.

SPECIAL PRIZES

Special prizes are occasionally offered by various departments.

MILITARY DIPLOMAS

The commandant is authorized to give military diplomas, countersigned by the president of the college, to those men receiving the degree of Bachelor of Science who by their work in the military department during their course in college have shown themselves worthy of distinction. These diplomas recommend those receiving them for commissions in the United States army or in the militia of the several states, vouching that they are fitted to fill the position of commissioned officers.

Award of Prizes

1905—1906

Grinnell Agricultural Prizes—Senior

First of $30 to Edwin Hobard Scott
Second of $20 to Edwin Francis Gaskill

Hills Botanical Prizes—Senior

Best collection of Massachusetts Trees and Shrubs: Daniel Henry Carey, $15
Best collection of Massachusetts Woods: James Edward Martin, $10

Military Honors—Senior

The following cadets were reported to the Adjutant General, U. S. Army, and to the Adjutant General of Massachusetts, as having shown special aptitude for military service:

Herman Augustus Suhlke
George Talbot French
Stanley Sawyer Rogers
Benjamin Strain

Farm Woodlot Essay Prize—Junior and Senior

Second of $10 to Charles Morton Parker

Flint Oratorical Prizes –Junior

First, Wayland Fairbanks Chace
Second, Charles Morton Parker

Western Alumni Association Improvement Prize—Sophomore

Scholarship, Character and Example: John Daniel, $25

Burnham Competition Prizes—Sophomore

First of $20 to Danforth Parker Miller
Second of $10 to Herbert Linwood White
Third of $5 to Orton Loring Clark
Honorable Mention, Roland Hale Verbeck

Burnham Declamation Prizes—Freshman

First of $25 to Oscar Christopher Bartlett
Second of $20 to Paul Edgar Alger

Short Course in Dairy Farming

Massachusetts Society for Promotion of Agriculture

For general excellence, first prize, $50, Helen Holmes; second prize, $30, Nelson Lansing Martin, Jr.; third prize, $20, John Anson Newhall.

For highest scoring butter, first prize, $25, Francis Curry; second prize, $15, Nelson Lansing Martin, Jr.; third prize, $10, divided between Leslie Rogers Corbin and John Anson Newhall.

For excellence in stock-judging, first prize, $10, Lester Gifford Heath; second prize, $7.50, Frank David McKenzie; third prize, $5, John Wood Leonard, Jr.; fourth prize, $2.50, Henry Weston Trask.

Special Prizes

By W. H. Bowker of Boston, for best knowledge of use of fertilizers on the farm, one half ton of Stockbridge fertilizer, Helen Holmes.

By B. von Herff of New York, for best knowledge of use of fertilizers on grass lands, one ton of kainite, Helen Holmes.

Degrees Conferred in 1906

MASTER OF SCIENCE

Ballou, Arthur Henry	Barbados

BACHELOR OF SCIENCE

Carey, Daniel Henry*	Rockland
Carpenter, Charles Walter*	Monson
Craighead, William Hunlie*†	Boston
Filer, Harry Burton*	Palmer
French, George Talbot*	Tewksbury
Gaskill, Edwin Francis*	Hopedale
Hall, Arthur William, Jr.*†	North Amherst
Hastings, Addison Tyler, Jr.*	Natick
Hood, Clarence Ellsworth*	Millis
Kennedy, Frank Henry*	Ashmont
Martin, James Edward	Brockton
Moseley, Louis Hale*	Glastonbury
Mudge, Everett Pike*	Swampscott
Peakes, Ralph Ware*	Newtonville
Pray, Fry Civille*†	Natick
Rogers, Stanley Sawyer*	Boston
Russell, Harry Merwin*	Bridgeport, Conn.
Scott, Edwin Hobart*†	Cambridge
Sleeper, George Warren*†	Swampscott
Strain, Benjamin*	Mt. Carmel, Conn.
Suhlke, Herman Augustus*	Leominster
Taft, William Otis*	East Pepperell
Tannatt, Willard Colburn, Jr.*	Dorchester
Tirrell, Charles Almon*	Plainfield
Wellington, Richard*	Waltham
Wholley, Francis Dallas*	Cohasset
Wood, Alexander Henry Moore*	Easton
Total	28

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*Military Diploma.

†Degree of Boston University.

Graduate Students

CANDIDATES FOR A DEGREE

Back, Ernest Adna B. Sc., Massachusetts Agricultural College 1904	*Florence*	6 Phillips St.
Franklin, Henry James B. Sc., Massachusetts Agricultural College 1903	*Bernardston*	6 Phillips St.
Hooker, Charles Worcester B. A., Amherst College 1906	*Amherst*	5 North East St.
Ladd, Edward Thorndike B. Sc., Massachusetts Agricultural College 1905	*Winchester*	75 Pleasant St.
Monahan, Niel Francis B. Sc., Massachusetts Agricultural College 1903	*Amherst*	North Amherst
Russell, Harry Merwin B. Sc., Massachusetts Agricultural College 1906	*Bridgeport, Conn.*	96 Pleasant St.
Smith, Philip Henry B. Sc., Massachusetts Agricultural College 1897	*Amherst*	102 Main St.
Walker, Lewell Seth B. Sc., Massachussetts Agricultural College 1905	*Natick*	1 Mt. Pleasant

Total 8

NOT CANDIDATE FOR A DEGREE.

Turner, James Arthur *Springfield*

Total 1

Undergraduate Students

SENIOR CLASS

Alley, Harold Edward	*Gloucester*	Kappa Sigma House
Armstrong, Arthur Huguenin	*Hyde Park*	Kappa Sigma House
Bartlett, Earle Goodman	*Chicago, Ill.*	Wilder Hall
Caruthers, John Thomas	*Columbia, Tenn.*	32 North College
Chace, Wayland Fairbanks	*Middleboro*	96 Pleasant St.
*Chapman, George Henry	*Wallingford, Conn.*	6 South College
Chapman, Joseph Otis	*Brewster*	8 South College
Clark, Milford Henry, Jr.	*Sunderland*	5 South College
Cutter, Frederick Augustus	*Pelham, N. H.*	16 South College
Dickinson, Walter Ebenezer	*North Amherst*	North Amherst
Eastman, Jasper Fay	*Townsend*	101 North Pleasant St.
Hartford, Archie Augustus	*Westford*	John Walsh's
Higgins, Arthur William	*Westfield*	R. J. Goldberg's
King, Clinton	*Dorchester*	77 Pleasant St.
Livers, Susie Dearing	*Boston*	Draper Hall
Parker, Charles Morton	*Newtonville*	116 Pleasant St.
Peters, Frederick Charles	*Lenox*	18 South College
Shaw, Edward Houghton	*Belmont*	13 South College
Summers, John Nicholas	*Brockton*	6 South College
Thompson, Clifford Briggs	*Halifax*	14 South College
Walker, James Hervey	*Greenwich Village*	5 South College
Watkins, Fred Alexander	*West Millbury*	1 South College
Watts, Ralph Jerome	*Littleton*	East Experiment Station
Wood, Herbert Poland	*Hopedale*	R. J. Goldberg's
		Total 24

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*Work incomplete.

JUNIOR CLASS

Allen, Charles Francis	*Worcester*	96 Pleasant St.
✓ Anderson, John Albert	*North Brookfield*	17 South College
Anderson, Kenneth French	*Roslindale*	28 North College
Bailey, Ernest Winfield	*Worcester*	Kappa Sigma House
Bangs, Bradley Wheelock	*Amherst*	29 Lincoln Avenue
Barry, Thomas Addis	*Amherst*	20 South College
*Bartholomew, Persis	*Melrose Highlands*	Draper Hall
Bates, Carleton	*Salem*	Kappa Sigma House
Chapman, Lloyd Warren	*Pepperell*	4 South College
✓ Chase, Henry Clinton	*Swampscott*	7 South College
Clark, Orton Loring	*Malden*	Mt. Pleasant
Cobb, George Robert	*Amherst*	33 Cottage St.
Coleman, William John	*Natick*	Plant House
Cummings, Winthrop Atherton	*Bondsville*	L. H. Taylor's
Cutting, Leroy Edward	*Amherst*	11 High St.
Daniel, John	*Osterville*	4 South College
Davenport, Stearnes Lothrop	*North Grafton*	8 South College
Davis, Paul Augustin	*Lowell*	88 Pleasant St.
Dolan, Clifford	*Hudson*	9 Fearing St.
Eastman, Perley Monroe	*Townsend*	101 North Pleasant St.
*Edwards, Frank Laurence	*Somerville*	Nash Hall
✓ Farley, Arthur James	*Waltham*	11 South College
Farrar, Allan Dana	*Amherst*	1 Dana St.
Farrar, Parke Warren	*Springfield*	Kappa Sigma House
Flint, Clifton Leroy	*Amesbury*	Kappa Sigma House
Gillett, Chester Socrates	*Southwick*	Kappa Sigma House
Gillett, Kenneth Edward	*Southwick*	17 South College
Gowdey, Carlton Craig	*Bridgetown, Barbados*	116 Pleasant St.
✓ Hayes, Herbert Kendall	*North Granby, Conn.*	Kappa Sigma House
Howe, William Llewellyn	*Marlboro*	9 South College
*Hyslop, James Augustus	*Rutherford, N. J.*	12 South College
Ingalls, Dorsey Fisher	*Cheshire*	10 South College
Jackson, Raymond Hobart	*Amherst*	26 Lincoln Avenue
✓ Jennison, Harry Milliken	*Millbury*	12 South College
Johnson, Frederick Andrew	*Westford*	20 South College
Jones, Thomas Henry	*Easton*	E. H. Forristall's

Larsen, Lars David	*Bridgeport, Conn.*	East Exp't Station
Liang, Lai-Kwei	*Tientsin, China*	80 Pleasant St.
Miller, Danforth Parker	*Worcester*	Kappa Sigma House
✓Paige, George	*Amherst*	E. H. Forristall's
Parker, John Robert	*Poquonock, Conn.*	75 Pleasant St.
✓Philbrick, Edwin Daniels	*Somerville*	18 South College
Reed, Horace Bigelowe	*Worcester*	Kappa Sigma House
Regan, William Swift	*Northampton*	84 Pleasant St.
Sawyer, William Francis	*Sterling*	E. H. Forristall's
Shattuck, Leroy Altus	*Pepperell*	21 North College
Thurston, Frank Eugene	*Worcester*	15 South College
Turner, Olive May	*Amherst*	22 Spaulding St.
Turner, William Franklin	*Reading*	9 South College
Verbeck, Roland Hale	*Malden*	13 South College
✓Warner, Theoren Levi	*Sunderland*	24 North College
*Waugh, Thomas Francis	*Worcester*	28 North College
Wellington, Joseph Worcester	*Waltham*	11 South College
Wheeler, Hermon Temple	*Lincoln*	24 North College
Whiting, Albert Lemuel	*Stoughton*	Veterinary Laboratory
Whitmarsh, Raymond Dean	*Amherst*	88 Pleasant St.
*Wright, Samuel Judd	*South Sudbury*	10 South College
		Total 57

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*Work incomplete.

SOPHOMORE CLASS

Adams, William Everett	*Chelmsford*	88 Pleasant St.
Alger, Paul Edgar	*Somerville*	Professor Cooley's
Barnes, Benjamin Franklin Jr	*Haverhill*	Nash Hall
Bartlett, Oscar Christopher	*Westhampton*	R. J. Goldberg's
*Bean, Thomas Webster	*South Hadley Falls*	96 Pleasant St.
Bennett, Ernest Victor	*Malden*	25 North College
Briggs, Orwell Burlton	*Egremont*	Insectary
Brown, George Murray Jr.	*Cambridge*	E. H. Forristall's
*Burke, Edward Joseph	*Holyoke*	96 Pleasant St.
Caffrey, Donald John	*Gardner*	West Exp't Station
Cardin, Patricio Penneradonda	*Artemesia, Cuba*	66 Pleasant St.
Chase, Edward Irving	*Somerville*	82 Pleasant St.
Codding, George Melvin	*Taunton*	15 South College
Corbett, Lamert Seymour	*Jamaica Plain*	5 North College
Cox, Leon Clark*	*Boston*	Nash Hall
Cronyn, Theodore Reid	*Bernardston*	9 Fearing St.
Crosby, Harold Parsons	*Lenox*	John Walsh's
*Crossman, Samuel Sutton	*Needham*	10 North College
Curran, David Aloysius	*Marlboro*	John Walsh's
Cutler, Homer	*Westboro*	15 North College
Eddy, Roger Sherman	*Dorchester*	116 Pleasant St.
*French, Horace Wells	*Pawtucket, R. I.*	16 South College
Fulton, Gordon Russell	*Lynn*	West Exp't Station
*Gates, Clarence Augustus	*Worcester*	75 Pleasant St.
Geer, Myron Francis	*Springfield*	97 Pleasant St.
Geer, Wayne Emory	*Springfield*	97 Pleasant St.
Hathaway, Elmer Francis	*Cambridge*	Nash Hall
*Hayward, Warren Willis	*Millbury*	John Walsh's
Hsieh, En-Lung	*Tientsin, China*	44 Triangle St.
Hubbard, Arthur Ward	*Sunderland*	9 North College
*Ide, Warren Leroy	*Dudley*	82 Pleasant St.
Jen, Huan	*Tientsin, China*	80 Pleasant St.
Kenney, Walter James	*Lowell*	116 Pleasant St.
Knight, Harry Orrison	*Gardner*	West Exp't Station
Lindblad, Rockwood Chester	*North Grafton*	Professor Waugh's
Lull, Robert Delano	*Windsor, Vt.*	Nash Hall

MacGown, Guy Ernestus	*South Britain, Conn.*	E. H. Forristall's
Monahan, James Valentine	*South Framingham*	North Amherst
Neale, Harold Johnson	*Worcester*	96 Pleasant St.
*Noble, Harold Gordon	*Springfield*	75 Pleasant St.
Noyes, John	*Roslindale*	5 North College
*O'Donnell, John Francis	*Worcester*	6 Allen St.
O'Grady, James Raphael	*Holliston*	6 North College
*Oliver, Joseph Thomas	*Boston*	Professor Howard's
*Paddock, Harold Charles	*Claremont, N. H.*	9 Fearing St.
Phelps, Harold Dwight	*West Springfield*	87 Pleasant St.
Potter, Richard Chute	*Concord*	8 North College
Putnam, Charles Sumner	*Princeton*	101 North Pleasant St.
*Richardson, George Tewksbury	*Middleboro*	101 North Pleasant St.
Sexton, George Francis	*Worcester*	6 Nutting Avenue
*Shamiae, George Mansoor	*Damascus, Syria*	35 Lincoln Avenue
Smulyan, Marcus Thomas	*New York, N. Y.*	12 North College
Thompson, Myron Wood	*Halifax*	Nash Hall
Thomson, Jared Brewer	*Monterey*	25 North College
*Turner, Henry William	*Trinidad, Cuba*	116 Pleasant St.
Warner, Frederick Chester	*Sunderland*	9 North College
*Webb, Charles Russell	*Worcester*	96 Pleasant St.
Whaley, James Sidney	*East Orange, N. J.*	12 East Pleasant St.
White, Charles Howard	*Providence, R. I.*	82 Pleasant St.
Willis, Luther George	*Melrose Highlands*	10 North College
*Wilson, Frank Herbert, Jr.,	*Nahant*	8 North College
		Total 61

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*Work incomplete.

FRESHMAN CLASS

Allen, Rodolphus Harold	*Fall River*	96 Pleasant St.
Annis, Ross Evered	*Natick*	3 Fearing St.
Bailey, Justus Conant	*Wareham*	Nash Hall
Bartlett, Leslie Clarke	*South Hadley Falls*	South Hadley Falls
Beeman, Francis Stone	*West Brookfield*	77 Pleasant St.
Bigelowe, Windsor Howe	*Princeton*	6 Allen St.
Blaney, Jonathan Phillips	*Swampscott*	44 Pleasant St.
Brandt, Louis	*Everett*	44 Pleasant St.
Brooks, Henry Alvan	*Holliston*	11 North College
Brooks, Sumner Cushing	*Amherst*	Professor Brook's
Brown, Eben Hermon	*Bridgewater*	88 Pleasant St.
Brown, Louis Carmel	*Bridgewater*	88 Pleasant St.
Burrill, Ralph Parker	*South Weywouth*	
Call, Almon Eugene	*Lynn*	3 Fearing St.
Cary, William Ernest	*Gansevoort, N. Y.*	77 Pleasant St.
Chaffee, Alfred Brown	*Oxford*	
Chase, George Bancroft	*North Adams*	14 South College
Clarke, Walter Roe	*Milton-on-Hudson, N. Y.*	75 Pleasant St.
Cloues, William Arthur	*Warner, N. H.*	9 Fearing St.
Cowles, Henry Trask	*Worcester*	77 Pleasant St.
Curtis, William Edward	*Worcester*	75 Pleasant St.
Damon, Edward Farnham	*Concord Junction*	22 North College
Dickinson, Lawrence S.	*Amherst*	Plant House Grounds
Drohan, Joseph Chauncey	*Belchertown*	1 South College
Eldridge, Cecil Vernon	*Harwichport*	26 North College
Everson, John Nelson	*Hanover*	22 North College
Faelten, Willibald Carl	*Roxbury*	Nash Hall
Fisk, Raymond John	*Stoneham*	88 Pleasant St.
Folsom, Josiah Chase	*Billerica*	23 North College
Francis, Henry Russell	*Dennisport*	101 North Pleasant St.
Gould, Harold Alvin	*Cambridge*	Nash Hall
Hastings, David Beard	*New York Mills, N. Y.*	88 Pleasant St.
Hatch, William Marcus	*Springfield*	
Haynes, Frank Tuttle	*Sturbridge*	77 Pleasant St.
Hazen, Myron Smith	*Springfield*	5½ East Pleasant St.
Holland, Arthur Witt	*Shrewsbury*	27 North College
Howe, Chester Leroy	*Watertown*	
Huang, Chen-Hua	*Tientsin, China*	

Johnson, William Clarence	*South Framingham*	77 Pleasant St.
Kelley, Albert Crittenden	*Harwichport*	26 North College
Kelly, Edward Nicholas	*Globe Village*	
Lambert, Marjorie Willard	*West New Brighton, N. Y.*	Draper Hall
Leonard, Leavitt Edwin	*Pittsford, Vt.*	9 Fearing St.
Leonard, William Edward	*Belmont*	6 Allen St.
Lightbody, Winfred Curran	*South Framingham*	
Lipman, Isaac Birkhahn	*Woodbine, N. J.*	101 North Pleasant St.
McFarlane, George Elliot	*Methuen*	
McGraw, Frank Dobson	*Fall River*	96 Pleasant St.
McLaine, Leonard Septimus	*New York, N. Y.*	84 Pleasant St.
Mendum, Samuel Weis	*Roxbury*	116 Pleasant St.
Moore, Harold Ithiel	*Leominster*	Pleasant St.
Newcomb, Raymond Wallace	*Fitchburg*	75 Pleasant St.
Nickless, Fred Parker	*Carlisle*	23 North College
Nielsen, Gustaf Arnold	*West Newton*	116 Pleasant St.
Oertel, Charles Andrew	*South Hadley Falls*	South Hadley Falls
Orr, Lewis Jordan	*Portland, Me.*	Nash Hall
Orr, Philip Eastman	*Portland, Me.*	
Partridge, Frank Herbert	*Cambridge*	Nash Hall
Prouty, Frank Alvin	*Worcester,*	31 North College
Robb, Allen James	*Wilbraham*	82 Pleasant St.
Rockefeller, Harlan Victor	*Hudson, N. Y.*	
Schermerhorn, Lyman Gibbs	*Kingston, R. I.*	7 North College
Smith, Halliday Spencer	*Nyack, N. Y.*	
Smith, Stanley Sawyer	*Athol*	2 South College
Stalker, William Alexander	*Framingham*	"Plumtrees"
Stockwell, Chellis Wheeler	*Athol*	2 South College
Sullivan, Arthur James	*Dalton*	44 Triangle St.
Taylor, Israel Houston	*Leverett*	101 North Pleasant St.
Thomas, Frank Lincoln	*Concord*	27 North College
Titus, Willard McCready Snow	*New Braintree*	9 Fearing St.
Turner, Edward Harrison	*Reading*	Plant House
Urban, Otto Velorous Taft	*Upton*	9 Fearing St.
Vinton, George Newton	*Sturbridge*	Thomson House
Waldron, Ralph Augustus	*Hyde Park*	7 North College
Wallace, William Newton	*Amherst*	6 Phillips St.
Whitney, Raymond Lee	*Brockton*	E. H. Forristall's
Woodward, Walter Francis	*Worcester*	96 Pleasant St.

Total 77

Short Course

Beal, Walter Francis	Mendon
Beals, Gardner	Boston
Beeman, Norman Stone	West Brookfield
Bronson, James Steele	St. Albans, Vt.
Cadwell, Garfield Arthur	Chester
Crocker, Burt Allen	Sunderland
Damon, Edward Thomas	Cochituate
Ferry, Rutherford Hayes	Granby
Flagg, Caleb Belcher	Hardwick
Gleason, Walter Duncan	McIndoes Falls, Vt.
Guiel, Henry	South Amherst
Hall, Chester Huntington	Cambridge
Handy, Louise Holmes	Fall River
Healey, Thomas William	West Brimfield
Johnston, James	New York, N. Y.
Kelly, Edward Nicholas	Globe Village
Kennedy, Worthy Chester	Hardwick
Leonard, James Albert	Shoreham, Vt.
Littlefield, Earl Raymond	West Acton
Lowry, George Rufus	Canton
Maynard, Erwin Leslie	Jefferson
Peek, Henry Thomas	SmithtownBranch,N.Y.
Pratt, Carl Marvel	Hadley
Rankin, Henry Lawrence	Jefferson Valley, N. Y.
Raymond, Edward Lincoln	Boston
Richardson, Fred Louis	Ware
Robinson, Ernest Henry	Littleton Common
Scriven, Albert Kay	Hopedale
Shaw, Henry Southworth, Jr.	Boston

Small, Merrill Baker . . .	Watertown
Stone, Everett William . . .	Auburn
Trout, Charles Frank . . .	Pride's Crossing
Wall, Axel Hugo . . .	Berlin, Conn.
Warner, Raymond Anthony . .	Florence
Weaver, Forest Edwin . . .	Bemus Point, N. Y.
Whitman, George Craft . . .	Lynn
Wilson, Arthur Farley . . .	Medway
Wilson, John Irwin . . .	Greensboro, Vt.
	Total 38

Course in Bee Culture, 1906

Beebe, Katherine Smith . .	Holyoke
Bullard, Harriet Cox . . .	Franklin
Cunningham, Minnie . . .	Holyoke
Hutchinson, William Ford . .	Sutton
Lambert, Marjorie Willard . .	W. New Brighton, N.Y.
Rand, Jean C.	Holyoke
	Total 6

Summary by Classes

Graduate students	8	
Special students	1	
Senior class	24	
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		—272
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		270

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New Hampshire	3	
New Jersey	3	
Rhode Island	3	
Maine	2	
Illinois	1	
Tennesee	1	
China	4	
Cuba	2	
Barbados	1	
Syria	1	
Total		—270

Alumni Associations

ASSOCIATE ALUMNI

Founded 1874

President, E. A. Elsworth, '71, Holyoke.
Secretary, F. S. Cooley, '88, Amherst.

ALUMNI CLUB OF MASSACHUSETTS

Founded 1885.

President, Archie H. Kirkland, '94, Boston.
Secretary, F. W. Davis, '89, Roslindale.

MASSACHUSETTS AGRICULTURAL CLUB OF NEW YORK

Founded 1886.

President, Dr. Winfield Ayres, '86, New York City.
Secretary, Alvan R. Fowler, '80, 525 W. 23d St., New York City.

WESTERN ALUMNI ASSOCIATION

President, A. D. Smith, '95, Chicago.
Secretary, P. C. Brooks, '01, Chicago.

CONNECTICUT VALLEY ASSOCIATION

Founded 1902.

President, WALTER I. BOYNTON, '92, Springfield.
Secretary, H. D. HEMENWAY, '95, Northampton.

MASSACHUSETTS AGRICULTURAL CLUB OF WASHINGTON, D. C.

Founded 1904.

President, A. W. MORRILL, '00, Washington, D. C.
Secretary, F. D. COUDEN, '04, Washington, D. C.

HOME ASSOCIATION.

Founded 1905.

President, C. M. HUBBARD, '92, Sunderland.
Secretary, A. C. MONAHAN, '00, Montague.

Class Secretaries

1871.	E. E. Thompson, Worcester
1872.	S. T. Maynard, Northboro
1873.	C. Wellington, Amherst
1874.	
1875.	Madison Bunker, Newton
1876.	C. Fred Deuel, Amherst
1877.	
1878.	C. O. Lovell, New Rochelle, N. Y.
1879.	R. W. Swan, Worcester
1880.	
1881.	J. L. Hills, Burlington, Vt.
1882.	G. D. Howe, Portland, Me.
1883.	S. M. Holman, Attleboro
1884.	L. Smith, Springfield
1885.	E. W. Allen, Washington, D. C.
1886.	
1887.	D. H. Fowler, Boston
1888.	H. C. Bliss, Attleboro
1889.	C. S. Crocker, Boston
1890.	F. W. Mossman, Westminster
1891.	
1892.	H. M. Thomson, Thompson, Conn.
1893.	Fred A. Smith, Ipswich
1894.	S. Francis Howard, Amherst
1895.	H. A. Ballou, Barbadoes, W. I.
1896.	
1897.	C. A. Peters, Moscow, Idaho

1898. S. W. Wiley, Baltimore, Md.
1899. D. A. Beaman, Hartford, Conn.
1900. E. K. Atkins, Northampton
1901. J. H. Chickering, Dover
1902. H. L. Knight, Washington, D. C.
1903. G. D. Jones, North Amherst
1904. P. F. Staples, Woodbine, N. J.
1905. P. F. Williams, Natick
1906. Richard Wellington, Geneva, N. Y.

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MASSACHUSETTS AGRICULTURAL COLLEGE

AMHERST

CATALOGUE

1907-1908

PUBLISHED BY THE COLLEGE

> "Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."—*Act of Congress, July* 2, 1862.

MASSACHUSETTS AGRICULTURAL COLLEGE

AMHERST

CATALOGUE

1907-1908

PUBLISHED BY THE COLLEGE

The College reserves, for itself and its Departments, the right to withdraw or change the announcements made in this Catalogue.

Corrections, Additions, etc.

p. 12, l. 17—Insert: John A. Munson, A. B., A. M.,

p. 32, Junior Year—Read: "*Agriculture 5" (the subject if elected must be taken through the year).

p. 47—Under "Humanities," insert: Mr. Munson.

p. 64, Summer School Faculty—Add: Myron A. Cobb, B. S., Instructor in Chemistry; W. D. Hurd, B. S., Instructor in Field Crops.

pp. 65-66—SS2 not given by Professor Hart.
SS3 given by Mr. Cobb.
SS5 given by Professor Hurd.
SS16 given by Professor Hurd.

p. 80, l. 16—The zoölogical museum is open each week day at hours to be announced.

1907

JULY

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1908

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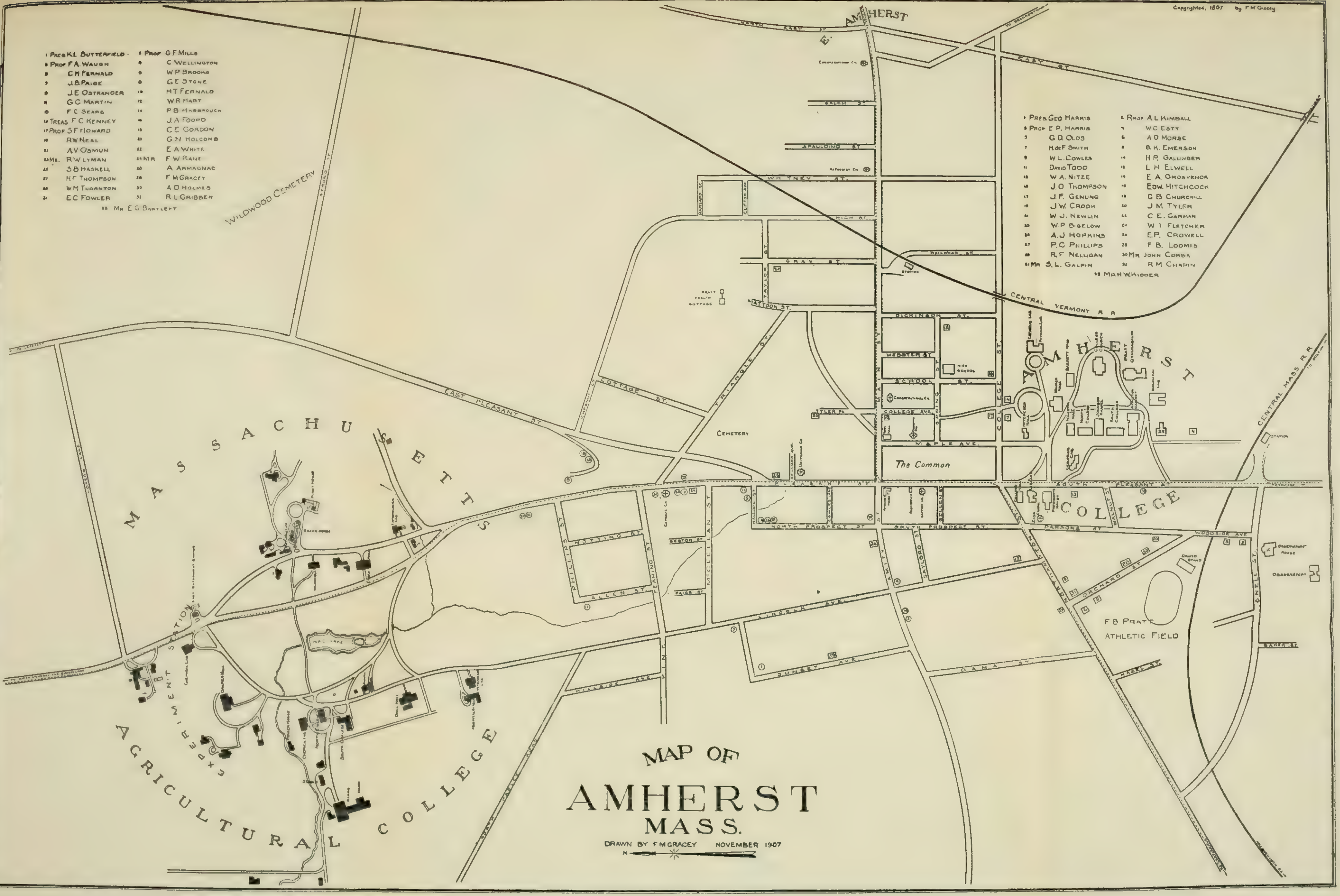

MAP OF AMHERST MASS.

DRAWN BY F.M.GRACEY NOVEMBER 1907

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CALENDAR

1907—September 17-18, Tuesday and Wednesday,
Entrance Examinations
September 19, Thursday, 8 a. m.......... First Semester Begins
November 28-December 1, Thursday-Sunday,
Thanksgiving Recess
December 19, Thursday................ Winter Recess Begins

1908—January 2, Thursday, 8 a. m.............. Winter Recess Ends
February 1, Saturday.......... Semester Examinations Begin
February 10, Monday, 8 a. m.......... Second Semester Begins
February 22,................ Washington's Birthday: Holiday
March 25, Wednesday, 6 p. m. .... Spring Recess Begins
April 2, Thursday, 8 a. m. .... Spring Recess Ends
April 19,............................ Patriots' Day: Holiday
May 13, Friday,................ Burnham Prize Essay Contest
May 30, ... Memorial Day: Holiday
June 1, Monday .... Senior Examinations Begin
June 8, Monday.............. Non-Senior Examinations Begin
June 17, Wednesday .... Commencement Exercises
June 18-19, Thursday-Friday,.......... Entrance Examinations
Long Vacation.
September 14-15, Monday-Tuesday,.... Entrance Examinations
September 14-16, Monday, Tuesday, Wednesday:
(a) Condition Examinations
(b) Enrolment in Classes
September 16, Wednesday, 1.30 p. m.,
Assembly: First Semester Begins
November 25-30, Wednesday, 1 p. m. to Monday, 1 p. m.,
Thanksgiving Recess
December 18, Friday, 6 p. m............ Winter Recess Begins

1909—January 4, Monday, 1 p. m............... Winter Recess Ends
February 1, Monday............ Semester Examinations Begin
February 8, Monday, 1 p. m...... .... Second Semester Begins
February 22, Monday,........ Washington's Birthday: Holiday
March 26, Friday, 6.00 p. m .... Spring Recess Begins

1909—April 5, Monday, 1 p. m.	Spring Recess Ends
April 19, Monday	Patriots' Day: Holiday
May 30	Memorial Day: Holiday
June 7, Monday	Senior Examinations Begin
June 15, Tuesday	Non-Senior Examinations Begin
June 19-23, Saturday to Wednesday	Commencement Exercises
June 24-25, Thursday-Friday	Entrance Examinations

MASSACHUSETTS AGRICULTURAL COLLEGE

The Massachusetts Agricultural College was among the first of the colleges established under the national land-grant act of 1862. This act gave "public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts;" it was framed by the late Senator Justin Smith Morrill of Vermont.

The College was incorporated in 1864, and on the second of October, 1867, was formally opened to an entering class of thirty-three. In January, 1875, an arrangement was made with the authorities of Boston University, under which the College, without losing its independence, became the School of Agriculture of the University. Under this arrangement, graduates of the Massachusetts Agricultural College may upon certain conditions receive the diploma in science awarded to graduates of the University. In 1882, the State Experiment Station was located on the College grounds. It has since been incorporated with the College.

The College offers a free education to any American student who may fulfil the requirements of admission. Women are admitted on the same conditions as men; foreign students pay a tuition fee. The four years course leads to the degree of Bachelor of Science, and graduate courses are given leading to the degree of Master of Science and of Doctor of Philosophy. Winter courses of ten weeks are given, and upon announcement special courses.

Situated in the beautiful town of Amherst, the College has an inspiring outlook. The campus is especially attractive. The grounds comprise more than 400 acres, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent. Amherst, ninety-seven miles west of Boston, is on the Central Vermont railroad and the Central Massachusetts division of the Boston and Maine railroad. Electric car lines connect the village with Northampton, Holyoke, Springfield, and other cities. The town library is open to students in addition to the College library, as are also good courses of lectures and concerts in the village, supplementing the various interests of college life.

THE MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

Massachusetts provided for the establishment of an agricultural experiment station in 1882. This station, though on the College grounds and supported by the state, was without organic connection with the College. Under an act of Congress passed in 1887, an agricultural experiment station was established as a department of the College. It was supported by the general government. For a time, therefore, Massachusetts had two experiment stations at the College. In 1894, these were combined, and the Station reorganized as a department of the College. It is now supported by funds from both the state and the general government. Recently the general government largely increased its support of experiment stations, on condition, however, that the money thus provided should be used only for research. The Station now receives about two-fifths of its support from the state.

The Station is under the direct supervision of the Board of Trustees. The chief officer is the Director, who is responsible to the President and to the Committee of the Board. The Station is organized into a number of Departments, all coöperating toward the betterment of agriculture. In most cases, the heads of the Station departments are heads of corresponding departments in the College. The work of the Station takes three directions; namely, control work, extension work, and investigation. The Station publishes numerous bulletins and an annual report. These publications, conveying information as to results of experiments, are free and circulate extensively, the mailing list containing some 20,000 addresses.

CORPORATION

MEMBERS OF THE CORPORATION

ARTHUR G. POLLARD of Lowell	Term expires	1909
CHARLES A. GLEASON of New Braintree	do	1909
FRANK GERRETT of Greenfield	do	1910
SAMUEL C. DAMON of Kingston, R. I.	do	1910
P. A. RUSSELL of Great Barrington	do	1911
CHARLES H. PRESTON of Danvers	do	1911
CARROLL D. WRIGHT of Worcester	do	1912
M. FAYETTE DICKINSON of Boston	do	1912
WILLIAM H. BOWKER of Boston	do	1913
GEORGE H. ELLIS of Boston	do	1913
J. HOWE DEMOND of Northampton	do	1914
ELMER D. HOWE of Marlboro	do	1914
NATHANIEL I. BOWDITCH of Framingham	do	1915
WILLIAM WHEELER of Concord	do	1915

MEMBERS EX-OFFICIO

HIS EXCELLENCY THE GOVERNOR, CURTIS GUILD, Jr.,	President of the Corporation
KENYON L. BUTTERFIELD	President of the College
GEORGE H. MARTIN	Secretary of the Board of Education
J. LEWIS ELLSWORTH	Secretary of the Board of Agriculture

OFFICERS OF THE CORPORATION

HIS EXCELLENCY THE GOVERNOR, CURTIS GUILD, Jr., of Boston,	President
CHARLES A. GLEASON of New Braintree	Vice-President
J. LEWIS ELLSWORTH of Worcester	Secretary
F. C. KENNEY of Amherst	Treasurer
CHARLES A. GLEASON of New Braintree	Auditor

EXAMINING COMMITTEE OF OVERSEERS

JOHN BURSLEY, Chairman	West Barnstable
ISAAC DAMON	Wayland
W. C. JEWETT	Worcester
E. L. BOARDMAN	Sheffield
FRANK GERRETT	Greenfield

OFFICERS OF THE INSTITUTION

THE FACULTY

KENYON L. BUTTERFIELD, A. M., 25 Sunset Ave.
President of the College and Professor of Rural Sociology

GEORGE F. MILLS, M. A., 46 Amity St.
Dean of the College, Head of the Division of the Humanities, and Professor of Languages and Literature

FRANK A. WAUGH, M. S., M. A. C.
Head of the Division of Horticulture and Professor of Landscape-Gardening

CHARLES WELLINGTON, Ph. D., 34 Amity St.
Professor of General and Agricultural Chemistry

CHARLES H. FERNALD, Ph. D., 3 Hallock St
Professor of Zoölogy

WILLIAM P. BROOKS, Ph. D., M. A. C.
Professor of Agriculture and Director of the Experiment Station

JAMES B. PAIGE, B. S., D. V. S., 42 Lincoln Ave.
Professor of Veterinary Science

GEORGE E. STONE, Ph. D., Mt. Pleasant
Professor of Botany

JOHN E. OSTRANDER, M. A., C. E., 33 North Prospect St.
Professor of Mathematics and Civil Engineering

HENRY T. FERNALD, Ph. D., 44 Amity St.
Professor of Entomology

GEORGE C. MARTIN, C. E., Captain, 18th U. S. Inf., Amh't House
Professor of Military Science and Tactics

WILLIAM R. HART, A. M., 46 North Pleasant St.
Professor of Agricultural Education

FRED C. SEARS, M. Sc., Mt. Pleasant
Professor of Pomology

PHILIP B. HASBROUCK, B. S., 130 North Pleasant St.
Associate Professor of Mathematics, Adjunct Professor of Physics, and Registrar

FRED C. KENNEY, Mt. Pleasant
Treasurer

JAMES A. FOORD, M. Sc., 35 North Prospect St.
Associate Professor of Agronomy

S. FRANCIS HOWARD, B. Sc., M. Sc., 10 Allen St.
Assistant Professor of Chemistry

CLARENCE E. GORDON, A. M., North Amherst
Assistant Professor of Zoölogy and Curator of the Zoölogical Museum

ROBERT WILSON NEAL, A. B.,M.A.,A.M. 56 North Pleasant St.
Assistant Professor of English and Instructor in German

GEORGE N. HOLCOMB, A. B., S. T. B., 12 Lincoln Ave.
Assistant Professor of Political Science

A. VINCENT OSMUN, B. S., M. Sc., North Amherst
Assistant Professor of Botany

EDWARD A. WHITE, B. Sc., 55 North Pleasant St.
Assistant Professor of Floriculture

ROBERT W. LYMAN, B. Sc., LL. B., Northampton
Lecturer on Farm Law

FRANK W. RANE, M. S., State House, Boston
Lecturer on Forestry

*LOUIS R. HERRICK, B. S.,
Instructor in French and Spanish

†SIDNEY B. HASKELL, B. Sc., University of Leipsic
Instructor in Agriculture

---

* Resigned; Instructor in French, University of Wisconsin.
† On leave of absence.

HAROLD F. TOMPSON, B. Sc., Wilder Hall
Instructor in Market-Gardening

*AUGUSTUS ARMAGNAC, Ph. D., 35 North Prospect St.
Instructor in French

FRANK M. GRACEY, 58 North Pleasant St.
Instructor in Landscape-Gardening

WILLIAM M. THORNTON, Jr., A. B., A. M., 14 Amity St.
Instructor in Chemistry

ARTHUR D. HOLMES, B. S., 96 North Pleasant St.
Instructor in Chemistry

ERNEST C. FOWLER, B. S., 96 North Pleasant St.
Instructor in Chemistry

RAY L. GRIBBEN, B. S. A., 66 North Pleasant St.
Instructor in Animal Husbandry

EARLE G. BARTLETT, B. Sc., 69 South Pleasant St.
Instructor in Botany

____
Instructor in French and German

ADDITIONAL INSTRUCTORS: SHORT COURSES

Summer School of Agriculture, 1907

E. H. SCOTT, B. S.,
Registrar and Instructor in Plant Culture

PHILIP EMERSON,
Instructor in Methods

CLARENCE MOORES WEED,
Instructor in Insect Life

E. H. FORBUSH,
Instructor in Bird Life

H. D. HEMENWAY, B. S.,
Instructor in School Gardening and Practical Gardening

---

* Dead.

Winter Course in Dairy Farming, 1908

WILLIAM G. LANGWILL,
Butter Expert

H. A. PARSONS,
Instructor in Babcock Testing

NATHAN J. HUNTING, B. S.,
Instructor in Use of Separators

CHARLES W. HOOKER, B. A.,
Instructor in Entomology

OTHER COLLEGE OFFICERS

MISS E. FRANCES HALL, Leverett St., North Amherst
Librarian

MISS GRACE M. KNOWLES, B. S., Draper Hall, M. A. C.
Secretary to the President

ELWIN H. FORRISTALL, M. Sc., M. A. C.
Farm Superintendent

MISS VESTA C. HANEY, Draper Hall
Bookkeeper

MISS CORNELIA B. BALL, North Amherst
Stenographer, Division of Horticulture

MISS MARY CALDWELL, Draper Hall
Stenographer

NEWTON WALLACE, 6 Phillips St.
Electrician

E. CHARLES ROWE, M. A. C.
Steward of the Dining Hall

OFFICERS OF THE EXPERIMENT STATION

CHARLES A. GOESSMANN, Ph. D., LL. D.,
Honorary Director and Expert Consulting Chemist

WILLIAM P. BROOKS, Ph. D.,
Director

Department of Plant and Animal Chemistry

JOSEPH B. LINDSEY, Ph. D.,
Chemist

EDWARD B. HOLLAND, M. S.,
Associate Chemist, in Charge of Research Division

ROBERT D. MACLAURIN, Ph. D.,
First Assistant in Research Division

HENRI D. HASKINS, B. Sc.,
In Charge of Fertilizer Division

PHILIP H. SMITH, B. Sc.,
In Charge of Feed and Dairy Division

ROY F. GASKILL,
Assistant in Animal Nutrition

LEWELL S. WALKER, B. Sc.,
Assistant

PHILIP V. GOLDSMITH, B. Sc.,
Assistant

JAMES C. REED, B. Sc.,
Assistant

Department of Agriculture

WILLIAM P. BROOKS, Ph. D.,
Agriculturist

ERWIN S. FULTON, B. Sc.,
First Assistant Agriculturist

EDWIN F. GASKILL, B. Sc.,
Second Assistant Agriculturist

Department of Horticulture

FRANK A. WAUGH, M. S.,
Horticulturist

E. A. WHITE. B. Sc.,
Floriculturist

CARL S. POMEROY, B. Sc., Ph. B.,
Assistant Horticulturist

Department of Botany and Vegetable Pathology

GEORGE E. STONE, Ph. D.,
Botanist and Vegetable Pathologist

GEORGE H. CHAPMAN, B. Sc.,
Assistant Botanist

Department of Entomology

CHARLES H. FERNALD, Ph. D.,
Entomologist

HENRY T. FERNALD, Ph. D.,
Associate Entomologist

HENRY J. FRANKLIN, B. S.,
First Assistant Entomologist

JOHN N. SUMMERS, B. Sc.,
Second Assistant Entomologist

Department of Veterinary Science

JAMES B. PAIGE, B. S., D. V. S.,
Veterinarian

Department of Meteorology

JOHN E. OSTRANDER, M. A., C. E.,
Meteorologist

THOMAS A. BARRY,
Observer

Other Experiment Station Officers

MISS FLORENCE L. DACY,
Secretary to the Director

MISS JESSIE V. CROCKER,
Stenographer

MISS HARRIET COBB,
Stenographer

WILLIAM K. HEPBURN,
Inspector, Feed and Dairy Division

COMMITTEES OF THE FACULTY

Instruction:

Professor MILLS
Professor WELLINGTON
Professor OSTRANDER
Professor WAUGH
Professor HART

Entrance Examinations and Admission:

THE REGISTRAR
Assistant Professor HOWARD
Assistant Professor GORDON
Assistant Professor NEAL
Assistant Professor HOLCOMB

Graduate School:

Prof. C. H. FERNALD
Professor WELLINGTON
Professor STONE
Prof. H. T. FERNALD
Professor WAUGH
Professor MILLS

Student Activities :

THE DEAN
Professor STONE
Captain MARTIN
Professor SEARS
Mr. BARTLETT

Athletics :

Professor PAIGE
Captain MARTIN
Assistant Professor GORDON

Catalogue and other Publications :

Assistant Professor NEAL
Assistant Professor HOLCOMB
Assistant Professor OSMUN

Library :

Professor STONE
Professor BROOKS
Prof. H. T. FERNALD
THE TREASURER

Schedule :

Professor OSTRANDER

THE PRESIDENT is ex-officio member of all the above-named committees.

Advisory Committee on Student Labor :

THE TREASURER
THE DEAN
THE REGISTRAR

Advisory Committee on Discipline :

THE DEAN
THE REGISTRAR
THE TREASURER
THE COMMANDANT

ADMISSION

- A. Application
- B. Subjects required
- C. Explanation of preparation required
- D. Modes of admission
- E. Times for examination
- F. Admission to advanced standing
- G. Other information about entrance.

A. APPLICATION FOR ADMISSION

Correspondence about admission should be addressed to the Registrar.

Every applicant for admission to the College must be at least sixteen years old and must present to the Registrar proper testimonials of good character. Such testimonials, whenever possible, should come from the principal of the school at which the applicant has prepared for college. If an applicant desires a free state scholarship, he must also present to the Registrar a certificate of appointment from the state senator of his district. All entrance credentials must be in the hands of the Registrar before the applicant can matriculate.

B. SUBJECTS REQUIRED FOR ADMISSION

Group I. Language :

Sub-group 1 : English (required)
Sub-group 2 : French or German (*one* required)

Group II. History and Civics :

Sub-group 1 : United States history and civics (required)
Sub-group 2 : History (elective ; *one* required)

- a. Ancient history
- b. Medieval and modern history
- c. English history
- d. General history

Group III. Mathematics and Science :

Sub-group 1 : Algebra, through quadratics (required)
Sub-group 2 : Plane geometry (required)
Sub-group 3 : Any *two* of the following (required)
  a. Chemistry
  b. Physiology
  c. Solid geometry

C. DETAILED EXPLANATION OF PREPARATION REQUIRED FOR ENTRANCE

Group I : Language

English :

The requirements in English are explained below :

a. Requirements in 1908 (p. 19)
b. Requirements after 1908 (p. 19)
c. Suggestions to teachers (p. 21)
d. Recommended books (p. 23)

a. In 1908 (*June and September*)

In 1908 the examination will be upon the contents, thought, incident, and characters of the recommended books; a general if clear and accurate knowledge of the works will be sufficient. As part of the examination, candidates will be asked to write a number of paragraphs upon topics chosen from a list set by the examiner for the purpose of testing the general information of the applicants and their ability to express themselves clearly and accurately. Knowledge of the rudiments of rhetoric and elementary skill in composition are therefore essential. A fuller suggestion of the kind of training that will be helpful is given under PROVISION A, p. 20, and SUGGESTIONS TO TEACHERS, p. 21.

b. After 1908

In English, preparation for entrance to the College will best be made according to the recommendations of the College Entrance Examination Board (address Sub-station 84, New York City), representing the recommendations of the Conference on Uniform Entrance

Requirements in English.* These requirements as interpreted by this College are stated in PROVISION A and explained under SUGGESTIONS TO TEACHERS. Direct questions may be put, but the examinations will call mainly for the writing of paragraphs upon a number of topics chosen from a list set by the examiner—perhaps not all of them upon the reading. Knowledge of the books is deemed less important than ability to think clearly and to write good English. Tests in grammatical skill may be included.

PROVISION A (the candidate receives entrance credit only): This provision requires (1) a general but clear and accurate knowledge of the recommended books (see d., p. 23), their thought, incident, and characters; (2) ability to interpret at sight prose and verse of medium difficulty; and (3) ability to spell correctly and punctuate intelligently, ability to write clear and grammatical sentences and clear and logical simple paragraphs, and a thorough understanding of the elementary principles of composition. For further indication of the standard of work implied, see SUGGESTIONS TO TEACHERS, p 21.

PROVISION B (the candidate must enter under PROVISION A, but receives advanced credit): Candidates who have had fuller preparation than that required under PROVISION A may after entrance take an additional examination for advanced standing. A full explanation of the necessary preparation will be sent upon request. Candidates passing this examination will be excused from part or all of the courses English A1 and A2. *No examination under Provision B will be given except on the first Friday following the entrance examinations in September; and no one will be admitted to this examination who has not passed with credit the examination under Provision A or been accepted upon certificate with good standing in English.* Notice of the examination hour will be posted on the English bulletin-board, South College.

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* The College purposes to adopt the recommendations of the Conference of New England Colleges on Entrance Requirements in English when they are announced. Meanwhile, the lists of the College Entrance Examination Board (agreeing with the recommendations of the Conference on Uniform Entrance Requirements in English) will be followed.

c. Suggestions to Teachers

In teaching, the best results are got when teachers work freely in their own way toward definitely planned ends. What the ends are which seem desirable in preparatory English, and the kind and amount of work deemed most likely to accomplish them, are stated in the following suggestions about PROVISION A and the examination that it contemplates:

1. *A general but clear and accurate knowledge of the books.*—This implies general ability to comment pointedly on obvious topics suggested by the books. The candidate should be able to name the important personages of the books and to give character-sketches of them and compare them with one another; to discuss their motives; to outline plot or argument; to reproduce leading incidents or scenes; and to indicate noteworthy parts of the works; and he should be able to state the reasons for his conclusions. But back of this should be real appreciation; he should have caught the interest and spirit of the work. If he have caught these, he will know the book well enough for all merely formal examination purposes.

2. *Ability to interpret at sight prose and verse of medium difficulty.*—Power to grasp the meaning of language without help other than the language itself affords is essential to successful study of any kind. Unquestionably a large part of the students who fail in college—whatever the subject—do so because they are not trained to understand language; and it is not infrequent for students who can pass a good examination upon annotated texts to fail badly upon much simpler passages that require only this independent power. In the examinations, therefore, passages will be given for paraphrase and amplification and the candidate will be expected not merely to reproduce the thought in substance, but to go further and bring out latent and implied meanings of words and phrases. The passages for interpretation will not be taken from the recommended books, as the purpose is, to determine whether the candidate has independent power to comprehend language. *This is not a new requirement, but merely the definite statement of a degree of preparation that is assumed generally as fundamental.*

3. *Skill in simple composition and knowledge of elementary principles of grammar and rhetoric.*—To satisfy this requirement under PROVISION A, sufficient knowledge of the principles of composition can be got (for example) from Maxwell's *Writing in Eng-*

lish, especially chapters 3, 4, 6, 8-10, and 13, or Lewis's *First Manual of Composition*, especially chapters 1-5, or Keeler & Adams's *High School English*, especially chapters 3-8 or 3-6 and 10, or Scott & Denney's *Elementary English Composition*. Teachers should simplify the theory and reduce it to essentials, but these essentials should be constantly enforced through much and varied practise. Subjects should be chosen from the ordinary experience of the pupils as frequently as from their reading; papers should be short; and much rewriting should be required.*

Applicants may be asked to demonstrate their knowledge of grammar in ways such as the reconstructing of sentences in different forms and the writing of sentences in which the same word-group shall have different functions—e. g., a clause serving as subject, then as object complement, as attribute complement, etc. Kellogg's *Rhetoric* contains a great deal of grammatical-rhetorical drill matter well adapted to give pupils a firmer hold upon both grammar and rhetoric and would therefore be helpful as a desk-book.

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* It is more important that pupils grasp fundamental processes and acquire skill in writing than that they learn a large amount of rhetorical detail. Hence simple text-books and continual writing are desirable. When more complete or advanced text-books are used, care will be needed to prevent rhetorical theory from usurping the place of composition practise. A number of more advanced books are mentioned here, the portions that contain matter especially important under PROVISION A being indicated in the parentheses.

Kellogg's *Rhetoric* (to p. 122); can be successfully used for elementary work.

Newcomer & Seward's *Rhetoric in Practice* (chs. v-vii); simple and practical.

Fulton's *Rhetoric and Composition* (chs. ii?, iii-v); clear statement of fundamentals.

Lewis's *Second Manual of Composition* (chs. ii-iv); emphasizes composition.

Scott & Denney's *Paragraph Writing* (to p. 68, with exercises); gives extensive practice.

Scott & Denney's *Composition-Literature* (chs. i?, ii, iii?, iv-v); clear, simple statement, good illustrations; can be made to yield much practise.

Scott & Denney's *Composition-Rhetoric* (chs. i-iii, vii); much like the *Composition-Literature*.

Plans and outlines of high-school courses of study adapted to college entrance requirements can be found in *English in Secondary Schools: A Four Years' Course*, by George C. Marsh (Scott, Foresman & Company, Chicago); in the *High-School Manual* of the University of Kansas (University of Kansas, Lawrence); and in the *Report of the Committee on College Entrance Requirements*, National Education Association (to be had for 25 cents from the Secretary, Dr. Irwin Shepard, Winona, Minn.). Keeler & Adams's *High School English* gives an arrangement of practical composition work in accordance with the course recommended by the Committee in this *Report*. Webster's *English: Composition and Literature* also suggests an arrangement of the courses in English adapted to the Committee recommendations.

d. Recommended Books

1908 (June and September)

In 1908 only, candidates may offer the following books, announced in the Catalogue of 1905-1906 ; namely,

Shakspere's *The Merchant of Venice;* Irving's *Life of Goldsmith;* Scott's *Ivanhoe* and *The Lady of the Lake;* Tennyson's *The Princess;* Coleridge's *The Ancient Mariner;* Lowell's *The Vision of Sir Launfal;* George Eliot's *Silas Marner.*

Or they may instead offer an equivalent number of books from the list announced in the Catalogue of 1906-1907 for the years 1908-1909 if they have prepared under that Catalogue. This list follows under the year 1909.

1909 (June and September)

Shakspere's *Macbeth* and *The Merchant of Venice;* Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso;* Webster's *First Bunker Hill Oration* with either Burke's *Speech on Conciliation* or Washington's *Farewell Address;* Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur;* Ruskin's *Sesame and Lilies*, Bunyan's *Pilgrim's Progress* (Part i) ; Scott's *Quentin Durward;* either Macaulay's *Life of Johnson* or Carlyle's *Essay on Burns.*

1910, 1911

After 1909 (and in that year if candidates so request), the lists of the College Entrance Examination Board, agreeing with those of the Conference on Uniform Entrance Requirements in English, will be in force, pending the recommendations of the Conference of New England Colleges on Entrance Requirements in English. The following list for the years 1909, 1910, and 1911, will therefore be in force for this College in 1910 and 1911. The New England Conference prefers those books indicated in the following list by an asterisk. *Preparation for entrance under Provision A need not extend to division b of this list.*

List

a. For reading and composition practise

Group 1 (*two* to be selected): Shakspere's *As You Like It Henry V*, **Julius Caesar*, *The Merchant of Venice*, *Twelfth Night*
Group 2 (*one* to be selected): Bacon's *Essays*; Bunyan's *The Pilgrim's Progress*, Part i; the **Sir Roger de Coverley Papers* in *The Spectator;* Franklin's **Autobiography*.

Group 3 (*one* to be selected): Chaucer's *Prologue*; selections from Spenser's *Faerie Queene;* Pope's *The Rape of the Lock;* Goldsmith's *The Deserted Village;* Palgrave's *Golden Treasury* (First Series), Books ii and iii, with especial attention to Dryden, Collins, Gray, Cowper, and Burns.

Group 4 (*two* to be selected): Goldsmith's *The Vicar of Wakefield;* Scott's **Ivanhoe* and *Quentin Durward;* Hawthorne's **House of the Seven Gables;* Thackeray's *Henry Esmond;* Mrs. Gaskell's *Cranford;* Dickens's **A Tale of Two Cities;* George Eliot's *Silas Marner;* Blackmore's *Lorna Doone.*

Group 5 (*two* to be selected): Irving's *Sketch Book*; Lamb's *Essays of Elia;* De Quincey's *Joan of Arc* and *The English Mail Coach;* Carlyle's *Heroes and Hero Worship;* Emerson's *Essays* (selected); Ruskin's *Sesame and Lilies.*

Group 6 (*two* to be selected): Coleridge's *The Ancient Mariner;* Scott's **The Lady of the Lake;* Byron's *Mazeppa* and *The Prisoner of Chillon;* Palgrave's *Golden Treasury* (First Series), Book iv, with special attention to Wordsworth, Keats and Shelley; Macaulay's **Lays of Ancient Rome;* Poe's *Poems;* Lowell's *The Vision of Sir Launfal;* Arnold's *Sohrab and Rustum;* Longfellow's *The Courtship of Miles Standish;* Tennyson's **Gareth and Lynette*, **Lancelot and Elaine*, and **The Passing of Arthur;* Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Evelyn Hope*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *The Boy and the Angel*, *One Word More*, *Hervé Riel*, *Pheidippides.*

b. For detailed study and practise

Shakspere's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso;* Burke's *Speech on Conciliation with America*, or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration;* Macaulay's *Life of Johnson* or Carlyle's *Essay on Burns.*

French:

The entrance requirements in French conform to those of the College Entrance Examination Board (the standard requirements; see address p. 19); but at present preparation is necessary in only first-year elementary French.* The work should comprise (1) careful drill in pronunciation; (2) the rudiments of grammar, including the inflections of the regular and the more common irregular verbs, the plural nouns, the inflections of adjectives, participles and pronouns; the use of personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; (3) abundant easy exercises, designed not only to fix in the memory the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (4) the reading of from 100 to 175 duodecimo pages of graduated texts, with constant practice in translating into French easy variations of the sentences read (the teacher giving the English), and in reproducing from memory sentences previously read; (5) writing French from dictation.

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* In both French and German, the requirements conform to the recommendations of the Committee of Twelve of the Modern Language Association for first-year elementary language. The College purposes soon to raise the modern language requirements to conform to the standard 2-year elementary requirements.

German:

The entrance requirements in German conform to those of the College Entrance Examination Board (the standard requirements; see address p. 19); but at present preparation is necessary in only first-year elementary German.* The work should comprise: (1) careful drill in pronunciation; (2) the memorizing and frequent repetition of easy colloquial sentences; (3) drill upon the rudiments of grammar; that is, upon the inflection of the articles, of such nouns as belong to the language of everyday life, of adjectives, pronouns, and weak verbs, and the more usual strong verbs; upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word-order; (4) abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; (5) the reading of from 75 to 100 pages of graduated texts from a reader, with constant practise in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English), and in the reproduction from memory of sentences previously read.

Group II. History and Civics

a. United States history and civil government	(Sub-group 1)
b. Ancient history	(Sub-group 2)
c. Medieval and modern history	
d. English history	
e. General history	

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* See footnote under FRENCH.

Preparation in the subjects of this Group will be satisfactory if made in accordance with the recommendations of the Committee of Seven of the American Historical Association as outlined by the College Entrance Examination Board.* The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good textbooks, collateral reading, and practise in written work. Geographical knowledge may be tested by requiring the location of places and movements on an outline map. The paragraphs of explanation that follow are suggestive only.

United States History and Civil Government:

A good knowledge of such a textbook as Channing's *Students' History of the United States* or Montgomery's *Students' American History* (revised edition), and of some such a book as Macey's *Our Government* or Boynton's *School Civics* will adequately prepare the student for the examination.

Ancient History:

Such a book as Myers's *Ancient History* (revised edition, entire) will supply the necessary outline. Greek and Roman history should receive most attention, the history of the other ancient nations being treated as introductory.

Medieval and Modern History:

A good general knowledge of the period from 476 to 1900 will be expected. Myers's *Mediæval and Modern History* (revised edition) will indicate the leading topics for study.

English History:

A knowledge of the history of England from the Roman conquest to 1900 will be presupposed. Montgomery's and Higginson and Channing's *English History* and Cheyney's *Short History of England* contain satisfactory outlines.

General History:

In general history, the history of Greece, Rome, continental Europe, and England will be emphasized. An outline of the essential topics can be gathered from such a textbook as Myers's *General History*.

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*For address, see p. 19.

Group III. Mathematics and Sciences

It is strongly recommended that students preparing for entrance take the mathematical review offered in most high school courses.

Algebra :

Through the first twenty-three chapters of Wells's *College Algebra*, or an equivalent. The student should be thoroughly drilled in the fundamental operations—factoring, greatest common divisor, least common multiple, equations of the first degree with one or more unknown quantities, problems which lead to equations of the first degree, involution and evolution of monomials and polynomials and the square and cube roots of numbers ; the theory of exponents, radicals, properties of quadratic surds, square root of a binomial surd, solutions of equations containing radicals, quadratic equations of one or more unknown quantities, simultaneous quadratic equations, and equations of higher degrees than the second which may be reduced to the quadratic form and then solved by the methods of solving quadratics.

Plane Geometry :

All of plane geometry as given in Wells or an equivalent will be required. Careful attention should be given to the exercises in geometry, cultivating the ability to demonstrate original exercises, and to solve numerical problems depending upon the theorems.

Solid Geometry :

All of Wells's *Solid Geometry* or an equivalent will be required. The work recommended for plane geometry is also urged for preparation in this subject.

Chemistry :

The following chapters in Newth's *Inorganic Chemistry* or Newell's *Descriptive Chemistry*, or their equivalents, will be covered in the entrance examination in chemistry :

Newth—Part 1. Chapters i to vii inclusive.
Part 2. Chapters i to viii inclusive.
Newell—Chapters i to xii inclusive

Physiology :

A student presenting himself for examination in physiology is supposed to have covered the ground outlined in the course as given in the College (see ZOOLOGY 2.). Hough & Sedgwick's *Human Mechanism* is recommended as a satisfactory text for such preparation.

D. MODES OF ADMISSION

Students are admitted to the freshman class either upon certificate or upon examination; but any certificate, to be accepted, must present at least 50 per cent of the subjects required for entrance. Those subjects lacking on certificate must be made up either at the time of the entrance examinations or at the times appointed for entrance condition examinations.

Certificates

The entrance requirements may be satisfied by certification in any of the following ways:

1. By presenting certificate from a school approved for such privilege by this College.
2. By presenting certificate from any school approved by the College Entrance Examination Boards
3. By presenting the customary credentials from the Board of Regents of the State of New York for any of the subjects of the entrance requirements.

Blank forms for certification—sent to principals or school superintendents only—may be obtained on application to the Registrar of the College.

Examinations

Places of Examination:

Examinations for admission to the college are held as follows:

In *June* of each year:

In Amherst, in the building of the Department of Mathematics, Massachusetts Agricultural College.
In Boston, in the College of Liberal Arts of Boston University, Boylston St., corner of Exeter.
In Worcester, in Horticultural Hall.
In Pittsfield, in the City Hall.

In *September* of each year:

In Amherst *only*, in the Building of the Department of Mathematics, Massachusetts Agricultural College.

Time Schedule for Examinations, 1908:

The examinations for entrance in 1908 will be held on the following dates:

In *June*, on Thursday, June 18 and Friday, June 19.

In *September*, on Monday, September 14 and Tuesday, September 15.

The schedule for examination in both June and September will be as follows:

First Day

8:30 a. m.	Registration
9:00 a. m.	Chemistry, solid geometry
11:00 a. m.	United States history and civics
2:00 p. m.	Plane geometry
4:00 p. m.	History elective (Group II, Sub-group 2)

Second Day

8:30 a. m.	Algebra
10:30 a. m.	Physiology, chemistry
2:00 p. m.	English
4:30 p. m.	French *or* German

F. ADMISSION TO ADVANCED STANDING

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this requirement, a student transferring to this College from another college or university of recognized standing must present the following credentials.

1. A letter of honorable dismissal from the institution with which he has been connected.
2. A statement or certificate of his entrance record.
3. A statement from the proper officer showing a complete record of his work while in attendance.
4. A marked catalogue showing the courses pursued.

These credentials should be presented to the Registrar. Applications will be judged wholly on their merits, and the College may prescribe additional tests before accepting applicants or determining the standing to be granted them.

G. OTHER INFORMATION ABOUT ENTRANCE

1. The privileges of the College may be withdrawn from any student at any time if such action is deemed advisable. (It is immaterial whether the pupil has entered by certificate or by examination.)

2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 65 per cent.

3. Candidates must pass at least five of the subjects required for entrance, and will be conditioned in those subjects not passed. No candidate deficient in both algebra and plane geometry will be admitted.

4. Opportunities for removing entrance conditions are given six weeks after the opening of the college year. If a student fail at that time to clear his record of conditions, he is given a second opportunity two weeks before the close of the first semester of the freshman year.

5. Credits for entrance requirements, whether gained by certificate or by examination, will hold good for one year.

6. Preliminary examinations in part of the subjects required for entrance may be taken one year before entering college.

7. No special students, unless college graduates, will be admitted to undergraduate work.

8. For information concerning expenses, scholarships, etc., see GENERAL INFORMATION.

9. For information concerning admission to short courses (Winter courses and Summer School), see SHORT COURSES.

COURSES OF INSTRUCTION

A. Table of undergraduate subjects
B. Undergraduate courses
C. Graduate courses
D. Short courses

TABLE OF UNDERGRADUATE SUBJECTS

[The figures indicate the number of credit hours a week.]

Freshman Year

All Studies Required

First Semester:

Language	English A1	2
	French 1 or German 1	4
Mathematics and Science	Mathematics 1 (algebra)	5
	Agriculture 1	3
	Botany 1	3
(Military Science 1)		
		—17

Second Semester:

Language	English A2	4
	French 2 or German 2	4
Mathematics and Science	Mathematics 4 (trigonometry)	3
	Botany 2	2
	One of this group	2
	Zoölogy 2 (physiology)	
	Chemistry 2b (*half*-course 4 hours)	
	Mathematics 2 (solid geometry)	
Political Science 2 (history)		4
(Military Science 2)		
		—19

Sophomore Year

All Studies Required

First Semester:

Language	English 1	3
	French 3 or German 3	3
Mathematics and Science	Physics 1	4
	Agriculture 3	4
	Chemistry 3a-3b	3
	Zoölogy 3	2
Military Science 3		1
		—20

Second Semester:

Language	English 2	4
	French 4 or German 4	3
Mathematics and Science	Physics 2	4
	Agriculture 4	3
	Chemistry 4a-4b	3
	Horticulture 2	3
	Civil Engineering 2	2
Military Science 4		1
		—23

Junior Year

First Semester:

Required Courses

Political Science 3 (economics)	4
Public Speaking 1	4
Military Science 5	1
	— 9

Elective Courses

[From the following each student must elect enough subjects to make not less than 17 nor more than 21 credit hours a week. All elections must be subject to the schedule and the approval of the Faculty. Subjects marked with an asterisk run through the year]:

*Landscape-Gardening 1	4
*Zoölogy 5	4
*Civil Engineering 3, 5	4
*Chemistry 5a, 5b, 7, 9, 11b	†
*Horticulture 3 (arboriculture)	4
Agriculture 5	4
Landscape-Gardening 5 (drawing)	2
Botany 3	3
Agricultural Education 1, 3	†
Mathematics 3 (analytical geometry)	4
Pomology 1	3

Second Semester:

Required Courses

Geology 2a-2b	2
Military Science 6	1
	— 3

Elective Courses

[Each student must elect enough subjects to make not less than 17 nor more than 21 credit hours a week. All elections must be subject to the schedule and the approval of the Faculty. Full-year subjects elected in the first semester must be included among the electives of the second semester, nor can full-year subjects be elected in the second semester unless also taken in the first semester, except by special permission from the instructor for the second semester. The full-year subjects are marked with an asterisk.]

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† Hours vary with the courses.

*Agriculture 6	4
*Chemistry 6a, 6b, 8, 16a	†
*Civil Engineering 4, 6	4
*Landscape Gardening 2	4
*Zoölogy 6	4
*Botany 4, 6	†
Landscape-Gardening 6 (drawing)	4
Market-Gardening 2	4
Entomology 2	4
Mathematics 6 (calculus)	4
Agricultural Education 2	3
Rural Social Science 2, 4	3

Senior Year

Required Courses

First Semester:

Veterinary Science 1a (bacteriology) Political Science 5b (government)	†

Second Semester:

Political Science 6 (government)	4

Elective Courses

Both Semesters:

[Each student must elect enough subjects to make not less than 12 nor more than 16 credit hours a week each semester, and in all to amount to 28 credit hours. The courses elected must correlate closely with the junior-year courses. Only one language besides English may be elected.]

Agriculture 7, 8	4
Market-Gardening 3	4
Horticulture 4	4
Veterinary Science 3-4	4
Botany 7-8, 9-10, 11-12, 13-14	4
Landscape-Gardening 3-4	4
Entomology 3-4	4
Physics 3-4	4
Floriculture 1-2	4
Civil Engineering 3-4, 5-6	4
English 5-6	4
French 5-6	4
German 5-6	4
Spanish 1-2	4
Latin	4
Pomology 3a-3b	3
Agricultural Education 2‡, 3, 4	†
Chemistry 11b, 13a, 13b, 15a, 16a, 16b	†
Rural Social Science 2, 4, 6	†
Military Science 7-8	2
Mathematics 3, 6	4

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† Hours vary with the courses. ‡ In 1907-08 only.

UNDERGRADUATE COURSES

LEADING TO THE DEGREE BACHELOR OF SCIENCE

All courses given in the first semester bear odd numbers; all given in the second semester bear even numbers; courses given in the first half of a semester are indicated by the letter *a* following the course number; those given in the second half of a semester are indicated by the letter *b*; capital letters preceding the number of a course have no reference to semester or session. Studies are pursued in courses, *half*-courses, *double*-courses, etc., " course " implying the study of a subject through one semester, but without regard to the number of hours or of credits. Credits are to be sent in (by both name and number) for courses and *half*-courses only; in making out credits, *double*-courses are treated as 2 separate courses, and *part*-courses are grouped in *half*-course or course groups.

Department of Agricultural Education

Professor HART

II. Elective Courses

1. **Meaning of Education.**—This course includes a study of the processes of the mind in learning, of the relations between the mind and the nervous system, of the stages of mental growth, and of the individual's appropriation of race achievements. Lectures, discussions, text-book, assigned readings, and reports. Junior course; 3 hours a week. Not given in 1907-08. Credit 3 hours. Professor HART

2. **Vocational Education.**—This course gives a survey of the educational movements which have had specific vocations as their chief motives, and includes a critical study of the growth and meaning of schools of medicine, law, oratory, theology, knighthood, education, and agriculture, emphasizing the last most. Lectures, readings, and reports, and a thesis upon some phase of agricultural education. Junior course (open in 1907-08 to juniors and seniors); 3 hours a week. Credit 3 hours. Professor HART

3. **Methods in Agricultural Education.**—This course contemplates a study of the methods of teaching agriculture in secondary schools—the selection and organization of the subject-matter adapted to high-school grades, the kind and quantity of work advisable, and

the relation of agriculture to other science subjects now included in high-school courses. Lectures, readings, and reports, with the preparation of a detailed outline of agricultural courses for secondary schools. Junior-senior course; 2 hours a week. Credit 2 hours.
Professor HART

4. **Seminar in Pedagogy.**—The seminar course is intended for students who wish to make an exhaustive study of some phase of agricultural education. Among topics which may be studied are: Legislation and agricultural education; agricultural societies as educational forces; the place and value of agricultural science in school courses; the relation of high-school agricultural courses to courses in the grades and to college courses. Senior course; prerequisites, courses 1 and 2; 1 hour a week. Credit 1 hour. Professor HART

Department of Agriculture

Professor BROOKS, Associate Professor FOORD, Mr. GRIBBEN

I. Required Courses

1. **Animal Breeding.**—A study of the laws which govern heredity and their application to the breeding of farm animals. Shaw's *Animal Breeding* to be used as text, supplemented by lectures and reference reading. Freshman course; 3 hours a week. Credit 3 hours.
Mr. GRIBBEN

3. **Types and Breeds of Farm Live-stock.**—The origin and development of those breeds of live stock of importance in the United States, and of some types more or less unknown here. The characteristics of each breed, the conditions to which best adapted, and the more popular strains or families, are some of the topics given attention. When possible, the student is given work in tracing pedigrees of noted animals of the particular sort he is studying. Plumb's *Types and Breeds of Farm Animals*, with lectures by instructor. Sophomore course; 4 hours a week. Credit 4 hours. Mr. GRIBBEN

4. **Farm Dairying and Soils.**—a) A general study of problems commonly met with under ordinary farm conditions, with particular reference to milk production. The equipment necessary to the best management of a market milk-farm is considered and due reference made to some of the more common products of milk. Wing's *Milk and its Products*, with lectures by instructor. Soph-

omore 8-week *part*-course; 3 hours a week. b) The formation classification, composition and physical and chemical characteristics of soils and the relation of the latter to maintenance and increased productiveness. Sophomore 10-weeks *part*-course; 2 lectures or recitations and 1 2-hour laboratory period a week. Credit (a and b) 3 hours. Associate Professor FOORD and Mr. GRIBBEN

II. Elective Courses

5. **Soil Improvement.**—A study of tillage, drainage, irrigation, and green manuring as methods of soil improvement, followed by a careful consideration of the composition, properties, value and use of manures and commercial fertilizers. Lectures and text-book; Brooks's *Agriculture*, vols. 1 and 2. Junior course; prerequisites, Chemistry 2b and 3a-3b; 3 lectures or recitations and 1 2-hour laboratory period a week. Credit 4 hours.

Professor BROOKS and Associate Professor FOORD

6. **Agronomy.**—A brief study of the history, classification, cultivation, harvesting, and rotation of field crops with special reference to their adaptability to soil and climatic conditions. The crops studied will include grasses, legumes, cereals, annual forage crops, and special commercial crops. Junior course; prerequisites, Botany 1 and 2; 3 lectures or recitations and 1 2-hour laboratory period a week. Credit 4 hours. Associate Professor FOORD

7. **Stock-judging, Advanced Dairying, and Silos and Ensilage.**—a) Lectures on the principles of animal selection, especially on the selection of horses, cattle, sheep, and swine. Judging practise, consisting of preliminary work with the score card until the student shows sufficient familiarity with the live animal, followed by actual comparative judging of stock. Senior 6-weeks *part*-course; 1 lecture and 3 2-hour laboratory periods a week. b) Lectures on the breeding, care, and management of a dairy herd (including sanitation and the precautions necessary to prevent common diseases). Dairy practise with separators and in butter-making and dairy testing. Senior 7-weeks *part*-course; 1 lecture and 3 2-hour laboratory periods a week. c) The historical development of silos and ensilage; the merits and methods of construction of the different kinds of silos; the crops suited for ensilage; ensilage machinery; methods of filling the silo; and the nature and extent of the changes taking place in ensilage as they affect food value. Lectures, books of reference, and

practical exercises. Senior 4-weeks *part*-course; 4 hours a week. Credit (a, b, and c) 4 hours.

Professor BROOKS, Mr. GRIBBEN, and SPECIALISTS

8. **Feeds and Feeding, Farm Equipment and Management, and Agricultural Experimentation.**—a) The principles of animal nutrition, with careful study of experimental and practical data on food stuffs. and their effects; practical questions of actual feeding. Jordan, *Feeding Farm Animals*; Henry, *Feeds and Feeding*; experiment station bulletins. Senior 6-weeks *part*-course; 4 hours a week. b) A brief consideration of farm buildings, machinery, fences, and water supply, of business methods and their application to the farm, and of farm accounts. Senior 6-weeks *part*-course; 3 lectures or recitations and 1 2-hour laboratory period a week. c) The development of experiment stations, the methods and character of their work, and the interpretation of experimental results. Senior 4-weeks *part*-course; 3 lectures and 2 seminars a week. Credit (a, b, and c) 4 hours. Associate Professor FOORD and Mr. GRIBBEN

BACTERIOLOGY

See DEPARTMENT OF VETERINARY SCIENCE

Department of Botany

Professor STONE, Assistant Professor OSMUN, Mr. BARTLETT

[The object of the courses in botany is, to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. Undergraduate work extending through six semesters is offered.

Considerable latitude is allowed students in the senior year in their electives, and besides the courses here outlined the students often take up the study of histology, systematic botany, the microscopic examination of pure and adulterated human and cattle foods, spices and drugs, etc. When the student is sufficiently prepared, special physiological and pathological investigations are occasionally undertaken. A botanical conference is held monthly wherein new problems in botanical science are considered by graduate students and the seniors who elect botany.]

I. Required Courses

1. **Plant Histology.**—This includes a study of the minute structure of stems, roots, leaves, and seeds, and of the chemical composi-

tion of plant constituents, with tests for them. The course is continued in Botany 2. Laboratory work and lectures. Freshman course; 2 2-hour laboratory periods and 1 lecture hour a week. Credit, 3 hours. Assistant Professor OSMUN

2. **Morphology and Systematic Botany.**—Continuous with Botany 1. Laboratory work in histology extends to the middle of March, the laboratory time during the remainder of the year being devoted to morphology and plant analysis. Lectures are given in physiology, morphology, ecology, evolution, and taxonomy. Each student is required to collect and prepare an herbarium of 75 species. Gray's *Manual of Botany* is used in determining and naming plants. Freshman course; 1 2-hour laboratory period and 1 lecture hour a week. Credit 2 hours. Assistant Professor OSMUN

II. Elective Courses

3 and 4. **Cryptogamic Botany.**—Systematic study of typical forms of the lower plants (bacteria, algae, fungi, lichens, mosses, and ferns); instruction in laboratory technique and methods; and the making of herbaria of lichens, mosses, and ferns. Laboratory work and lectures; field excursions for the purpose of observing environmental habits and collecting material for laboratory study; collateral reading. This course is intended for those students who wish to specialize in biology; its purpose is to afford more thorough scientific training than is offered in course 6, and students electing this course will attend the lectures in course 6. Junior *double*-course; 2 2-hour laboratory periods and 1 1-hour lecture period a week. Credit 3 hours. Assistant Professor OSMUN

6. **Vegetable Pathology.**—This course comprises a study of the common diseases of crops and consideration of the methods for their prevention and control. Laboratory work and lectures. The work in pathology is preceded by a brief preliminary study of the lower cryptogams, and is intended especially for students in horticulture and agriculture. Students electing any of the junior work may take botany in their senior year, and those electing the chemical course may take plant physiology in their senior year without having had the junior work in botany. Junior course; 1 2-hour laboratory period and 1 1-hour lecture period a week. Credit 2 hours.

Professor STONE and Assistant Professor OSMUN

7 and 8. **Plant Pathology.**—This course includes a study of the diseases of one or more crops and the methods of controlling them.

Laboratory work and lectures, together with extensive reading of experiment station literature. The course is intended for those who wish to become more familiar with the diseases of one or more groups of economic plants. Senior *double*-course; 3 2-hour laboratory periods and 1 lecture period a week. Credit 4 hours. Professor STONE

9 and 10. **Economic Fungi.**—This course comprises the study of economic fungi from a taxonomic point of view and is intended for those who wish a more comprehensive knowledge of the principal economic fungi, together with some knowledge of their phylogenetic relationships. Laboratory work and lectures; Tubeuf & Smith's *Diseases of Plants* is used as a guide, with special monographs on fungi and with the more important experiment station literature treating of the life-history of fungi. Senior *double*-course; 3 2-hour periods and 1 1-hour lecture period. Credit 4 hours. Professor STONE

11 and 12. **Plant Physiology.**—This course is largely experimental and is especially adapted to the needs of students who are taking chemistry. Laboratory work and lectures; various handbooks on plant physiology. Senior *double*-course; 3 2-hour periods and 1 1-hour lecture period. Credit 4 hours. Professor STONE

13 and 14. **Physiology and Pathology of Shade Trees.**—This course includes a comprehensive study of the diseases, structure and functions of trees and shrubs and of every agency which in any way affects shade trees. Laboratory work and lectures; extensive reference reading. Designed for those students who intend to take charge of parks or large estates, or to become tree wardens, city foresters, landscape gardeners, or professional advisers and caretakers. Senior *double*-course; 3 2-hour laboratory periods and 1 1-hour lecture period a week. Credit 4 hours. Professor STONE

Department of General and Agricultural Chemistry*

Professor WELLINGTON, Assistant Professor HOWARD, Mr. THORNTON, Mr. HOLMES, Mr. FOWLER

[These courses aim to teach accurate observation, logical thinking, and systematic and constant industry, together with a comprehensive knowledge of the subjects presented. Instruction is given through text-book, lecture, and a large amount of laboratory work under supervision. The laboratory work at first consists of the study of the properties of elementary matter, analysis of simple combinations, and their artificial preparation. This is followed by the quantitative analysis of salts, minerals, soils, fertilizers, and animal and vegetable products. The advanced instruction takes up the chemistry of various manufacturing industries, especially those of agricultural interest, such as the production of sugar, starch, and dairy products; the preparation of animal and plant foods, their digestive assimilation and economic use; the official analysis of fertilizers, fodders, and foods; and the analysis of soils, insecticides, fungicides, waters, milk, wine, and other animal and vegetable products.]

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* Announcements subject to change for 1908-1909.

I. Required Courses

2b. **The Non-metals.**—Lectures; Alex. Smith's *General Inorganic Chemistry*. Freshman *half*-course; 4 hours a week. Credit 4 hours. Assistant Professor HOWARD

3a. **The Common Metals.** — Lectures and laboratory work. Sophomore *half*-course; 6 hours a week. Credit 3 hours.
Assistant Professor HOWARD and Mr. HOLMES

3b. **Agricultural Mineralogy.**—Lectures and laboratory work; Brush's *Determinative Mineralogy* and Foye's *Handbook of Mineralogy*. Sophomore *half*-course; 5 hours a week. Credit 3 hours.
Mr. THORNTON

4a. **Agricultural Qualitative Analysis.**—Lectures and laboratory work; Medicus-Marshall's *Qualitative Analysis*. Sophomore *half*-course; 5 hours a week. Credit 2 hours.
Professor WELLINGTON and Mr. THORNTON

4b. **Agricultural Quantitative Analysis.**—Lectures and laboratory work; Robertson's *Practical Agricultural Chemistry*. Sophomore *half*-course; prerequisites, courses 2b, 3a, 3b, and 4a; 8 hours a week. Credit 4 hours. Professor WELLINGTON and Mr. HOLMES

II. Elective Courses

5a. **Agricultural Chemistry of the Air and Soil.**—Lectures and laboratory work; Ingle's *Manual of Agricultural Chemistry*. Junior *half*-course; 4 hours a week. Credit 2 hours.
Professor WELLINGTON and Mr. THORNTON

5b. **Chemistry of Plant Life.**—Lectures and laboratory work; Warrington's *Chemistry of the Farm*. Junior *half*-course; 4 hours a week. Credit 2 hours. Professor WELLINGTON and Mr. FOWLER

6a. **Chemistry of Animal Life.**—Lectures and laboratory work; Hammersten & Mandel's *Physiological Chemistry* and Armsby's *Principles of Feeding.* Junior *half*-course; 5 hours a week. Credit 3 hours. Professor WELLINGTON, Assistant Professor HOWARD, and Mr. FOWLER

6b. **Analysis of Foods and Fodders.**—Laboratory work; *Bulletin* 107 *of the United States Department of Agriculture.* Junior *half*-course; 5 hours a week. Credit 3 hours. Mr. FOWLER

7. **Organic Chemistry.**—Lectures and laboratory work; Haskins and McLeod's *Organic Chemistry* and Hollemann's *Organic Chemistry.* Junior course; 4 hours a week. Credit 2 hours. Mr. HOLMES

8. **Fermentations and Digestions.**—Laboratory work. Junior course; prerequisite, 4b; 5 hours a week. Credit 3 hours. Assistant Professor HOWARD and Mr. FOWLER

9. **Agricultural Research Chemistry.**—Original laboratory work and conferences. Junior course; prerequisite, 4b; 7 hours a week. Credit 4 hours. Professor WELLINGTON, Mr. THORNTON, and Mr. FOWLER

11b. **Dairy Chemistry.**—A study of the underlying principles of the production and handling of milk, cream, butter and cheese. Lectures, open with approval of instructor to all applicants. Junior *half*-course; 2 hours a week. Credit 2 hours. Professor WELLINGTON and Mr. THORNTON

13a. **Analysis of Insecticides, Fungicides, and Fertilizers.**—Laboratory work. Senior *half*-course; 7 hours a week. Credit 4 hours. Mr. HOLMES

13b. **High School Chemistry.**—A course for those intending to teach chemistry and agricultural chemistry in secondary and grade schools. Lectures and laboratory work. Senior *half*-course; 7 hours a week. Credit 4 hours. Assistant Professor HOWARD, Mr. HOLMES and Mr. FOWLER

14a. **Agricultural Chemical History and Literature.**—Conferences. Senior *half*-course, open with approval of instructor to all students; 3 hours a week. Credit 2 hours. Assistant Professor HOWARD

14b. **Agricultural Chemical Industries.**—Lectures and practical exercises. Senior *half*-course; 3 hours a week. Credit 2 hours. Professor WELLINGTON

15a. **Physical Chemistry.**—Lectures; Reychler-McCrae's *Physical Chemistry.* Senior *half*-course; 3 hours a week. Credit 2 hours. Assistant Professor HOWARD

CIVIL ENGINEERING

See DEPARTMENT OF MATHEMATICS, etc. p. 52.

ECONOMICS

See DIVISION OF THE HUMANITIES, p. 50.

ENGLISH

See DIVISION OF THE HUMANITIES, p. 47.

Department of Entomology

Professor C. H. FERNALD, Professor H. T. FERNALD.

[A knowledge of insects is of importance in every department of life and particularly in connection with agriculture, horticulture, biology, landscape-gardening, and forestry; it therefore forms part of a general education. An introductory course in this subject is accordingly offered in the junior year. For those who desire a further knowledge of the subject because of its importance to their future occupation, a senior course is also offered, so arranged as to be of especial value for those who expect to take up agriculture, horticulture, landscape-gardening, forestry, or science teaching, the work being largely individual with each student.]

II. Elective Courses

2. **General and Economic Entomology.**—This course includes consideration of the structure and life-histories of insects; a systematic study of the groups with reference to their economic importance; a study of methods of controlling injurious insects, including insecticides and apparatus, and of collecting, mounting, and classifying insects; and examination of the work of different insects. Junior course; 1 lecture hour and 6 laboratory or field exercise hours a week. Credit 4 hours. Prof. H. T. FERNALD

3 and 4. **Advanced Entomology.**—This course includes the study of the structure of insects as related to their classification, a study of the life-histories of insects, of economic entomology, and of the preparation, application, and value of insecticides, and gives training in the determination of insects, acquaintance with the literature of entomology, and skill in the use of it. A thesis is required, based on an extended study of the insects most closely related to

the future occupation of the student. Comstock's *Manual for the Study of Insects* is used in the laboratory work. Senior *double-course*; prerequisite, Entomology 2; 1 lecture hour and 6 laboratory or field-exercise hours a week. Credit 4 hours.

Profs. C. H. FERNALD and H. T. FERNALD

FORESTRY

See DIVISION OF HORTICULTURE, p. 44.

FRENCH

See DIVISION OF THE HUMANITIES, p. 49.

GEOLOGY

See DEPARTMENT OF ZOÖLOGY, p. 57.

GERMAN

See DIVISION OF THE HUMANITIES, p. 49.

GOVERNMENT

See DIVISION OF THE HUMANITIES, p. 51.

HISTORY

See DIVISION OF THE HUMANITIES, p. 50.

DIVISION OF HORTICULTURE

Professor WAUGH, Professor SEARS, Assistant Professor WHITE,
Mr. TOMPSON, Mr. GRACEY, Mr. RANE.

Departments

1. Horticulture
2. Pomology
3. Floriculture
4. Landscape-gardening
5. Market-gardening (section)

1. Department of Horticulture

[The general subject of horticulture divides naturally into the subjects of pomology, floriculture, landscape-gardening, and market-gardening. A number of courses relate to more than one of these subjects, and are therefore here grouped under the general designation of HORTICULTURE.]

I. Required Courses

2. **Nursery Practise.**—This course treats the fundamental operations of horticulture—propagation, pruning, cultivation—as related to the physiology of the plant. Lectures and practicums; Bailey's *Nursery Book* as text in propagation. Sophomore course; 3 hours a week. Credit 3 hours. Professor SEARS

II. Elective Courses

3. **Arboriculture.**—This course aims to make the student familiar with the character of all trees, shrubs, and herbaceous perennials used in ornamental work, and with the methods of propagating them. Junior course; prerequisite, Horticulture 2; 3 1-hour lecture periods and 1 2-hour laboratory period a week. Credit 4 hours.
Assistant Professor WHITE

4. **Plant Breeding.**—This course is designed to introduce advanced students to the best modern views of variation, heredity and evolution and the best methods of studying the phenomena found in these subjects. The principles educed apply to both animal-breeding and plant-breeding, but the laboratory work (of which there is considerable) is concerned chiefly with plant life. Some practise-work in hybridizing and selection is undertaken, and students are trained as far as possible in the practical application of those principles which have direct bearing on the breeding of plants and the cultivation of crops. Senior course; open only to students well prepared in agricultural or horticultural subjects; 5 hours a week. Credit 4 hours.
Professor WAUGH

A. **Forestry.**—A short course of lectures and field exercises to introduce students to the general principles of forestry management, including nursery work, sylviculture, forest mensuration, and exploitation, with special reference to the management of farm woodlots. This course is given annually by special arrangement with the state forester of Massachusetts. Mr. RANE

2. Department of Pomology

[See remarks and courses under HORTICULTURE, p. 43.]

II. Elective Courses

1. **Practical Pomology.**—A study of the practise of growing fruits such as apples, pears, plums, peaches, cherries, and quinces; of grape-culture; of small fruits such as blackberries, raspberries,

currants, gooseberries, and strawberries; and of selection of site, choice of stock, setting of plantation, fertilizing, cultivating, and spraying. Text and reference-books; field and laboratory exercises. Junior course; prerequisite, Horticulture 2; 4 hours a week. Credit 3 hours. Professor SEARS

3a. **Systematic Pomology.**—A study of the varieties of different fruits; of nomenclature and the identification of varieties, with critical descriptions and special reference to relationships and classification. Senior *half*-course; prerequisites, Horticulture 2 and Pomology 1; 4 hours a week. Credit 3 hours. Professor SEARS

3b. **Commercial Pomology.**—The storing and marketing of fruits, including a discussion of storage-houses, the handling and storing of fruits, fruit packages, methods of grading and packing, etc. Senior *half*-course; prerequisites, Horticulture 2, Pomology 1, and Pomology 3a; 4 hours a week. Credit 3 hours. Professor SEARS

3. Department of Floriculture

[See remarks and courses under HORTICULTURE, p. 43.]

II. Elective Courses

1. **Elements of Floriculture.**—In this course the principles of greenhouse construction and heating are taught, and much time devoted to practical greenhouse work, so that the student may become familiar with the management of floricultural establishments. Students are encouraged to visit large commercial establishments and to familiarize themselves with the practise of successful florists. Lectures and practical exercises. Senior course; must be followed by Floriculture 2; 4 hours a week. Credit 4 hours.

Assistant Professor WHITE

2. **Advanced Floriculture.**—This course discusses methods followed in the propagation and culture of greenhouse crops; wholesale and retail marketing; and the details of management of commercial establishments. Text-books, lectures, and practical exercises. Senior course; prerequisite, Floriculture 1; 4 hours a week. Credit 4 hours. Assistant Professor WHITE

4. Department of Landscape-Gardening

[See remarks and courses under HORTICULTURE, p. 43]

II. Elective Courses

1 and 2. **Elements of Landscape-Gardening.**—This course introduces the student to landscape-gardening as an art of design. Preliminary field work in surveying is followed by extended drafting-room study of classic and modern designs. Then follows the study of grade designs, estimates, contracts, and general engineering problems. Last comes a thorough study of road designs. The work is largely done in the field and the drafting-room; a few lectures are given; Waugh's *Landscape-Gardening* is used as a text. Students must have had some preparation in horticulture, arboriculture, and forestry, and should elect Drawing 1 and 2 and Horticulture 3 with this course. Junior *double*-course; 7 hours a week. Credit 4 hours.

Professor WAUGH

3 and 4. **Advanced Landscape-Gardening.**—This course is a continuation of Courses 1 and 2. Practical exercises are given in design of (a) roads and walks, (b) garden furniture and accessories, (c) sky lines; (d) in grouping of trees and shrubs; and (e) in complete projects. Lectures and practical exercises in reports, estimates, and professional practise. The work includes two courses of lectures, one on the esthetic valuation of landscape, and one on the history of landscape art, with a critical examination of the development, principles, and methods of the leading schools. Senior *double*-course; prerequisites, Landscape-Gardening 1 and 2 and either Horticulture 3 or Mathematics 3 and 4; 7 hours a week. Credit 4 hours.

Professor WAUGH

5. **Freehand Drawing.**—Lettering; sketching from type-models, leaves, fruits, vegetables, flowers, and trees, insects and small animals, laying flat and graded washes in water-colors; water-color rendering of fruits, vegetables, leaves, flowers, and trees; topographical lettering and conventional signs in ink; conventional coloring; mapping in ink and in water-colors. Junior course; 8 hours a week, Credit 4 hours. Mr. GRACEY

6. **Mechanical Drawing.**—Inking exercises, geometric problems, projection, intersections, isometric, shades and shadows; parallel, angular, and oblique perspective; perspective drawing of buildings. Junior course; 8 hours a week. Credit 4 hours. Mr. GRACEY

5. MARKET-GARDENING

[See remarks and courses under HORTICULTURE, p. 43.]

II. Elective Courses

2. **Essentials of Market-gardening.**—The course studies market-gardening and truck-farming as a business, considering problems of location, soils, and garden-fertilizing; methods of growing vegetables, both in the field and under glass; and methods of marketing. Lectures and practical exercises. Junior course; prerequisite, Horticulture 2; 4 hours a week. Credit 4 hours. Mr. TOMPSON

3. **Advanced Market-gardening.**—A continuation of the work begun in Market-gardening 2, considering further the growing of vegetables under glass and the marketing of garden produce. Special attention is paid to the study of varieties and their adaptation to various conditions and markets. Lectures and practical exercises. Careful note-taking and considerable collateral reading are required. Senior course; prerequisite, Market-gardening 2; 4 hours a week. Credit 4 hours. Mr. TOMPSON

DIVISION OF THE HUMANITIES

Dean MILLS, Assistant Professor NEAL, Assistant Professor HOLCOMB, Dr. ARMAGNAC, ________________, Miss HALL

Departments

1. English.
2. Modern European Languages.
3. Political Science.
4. The Library.

1. Department of English*

ENGLISH LANGUAGE AND LITERATURE

I. Required Courses

A1. **Introductory Composition and Literature.**—Theme-writing; required literary readings; assignments in text-books on composition. Recitations and conferences. Freshman course; required of all students not admitted with advanced standing in English; 2 hours a week. Credit 2 hours. Assistant Professor NEAL

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* Announcements subject to change for 1908-1909.

A2. **Introductory Composition and Literature.**—A continuation of English A1, which see. Freshman course; 4 hours a week. Credit 4 hours. Assistant Professor NEAL

1. **Theme Writing and American Literature.**—A composition-literature course carrying further the work of English A1 and A2; required readings in American authors, with written exercises in elementary criticism; theme-writing continued; assignments in text-books on composition; lectures as time permits on the authors read. Sophomore course; 3 hours a week. Credit 3 hours.

Assistant Professor NEAL

2. **English Literature.**—An outline of English literature from the earliest times to the Victorian age. Text-book study, collateral reading, and written exercises; long themes. Sophomore course; 4 hours a week. Credit 4 hours.

Professor MILLS and Assistant Professor NEAL

II. Elective Courses

5. **English Language and Literature.** — Class-room study of essayists and novelists of the nineteenth century; collateral readings; Carpenter's *Elementary Guide to Literary Criticism.* Senior course; 4 hours a week. Credit 4 hours. Professor MILLS

6. **English Language and Literature.**—This course is continuous with course 5. Lectures on the origin, history, and development of the English language; class-room study of nineteenth century poets and at least one of Shakspere's plays; collateral readings. Senior course; 4 hours a week. Credit 4 hours. Professor MILLS

PUBLIC SPEAKING

I. Required Courses

A2. **Declamation.**—Required as part of English A2 in addition to the work described in that course. Individual drill, followed by speaking in presence of the class. The choice of the Burnham Prize speakers depends upon this work.

Professor Mills and Assistant Professor NEAL

1. **Oration and Debate.**—Two orations, criticized by instructor, rehearsed, and delivered in presence of the class; oral debates, in presence of a section of the class, on propositions taken from college life and from history, politics, economics, and literature; written exercises on propositions already debated orally. Junior course; 4 hours a week. Credit 4 hours.

Professor MILLS and Assistant Professor NEAL

2. Department of Modern European Languages

GERMAN

I. Required Courses

1 and 2. **Beginning German.**—Freshman *double*-course; required of all freshmen not offering German upon entrance; 4 hours a week. Credit 4 hours. Dr. ARMAGNAC, ——————

3 and 4. **Second-year German.**—Sophomore *double*-course; required of all sophomores who have taken German 1 and 2; open to freshmen who enter with a 1-year credit in German and a 2-year credit in French; 3 hours a week. To be first given in 1908-1909. Credit 3 hours. ——————

A1 and A2. **Elementary German.**—A beginning course. Sophomore *double*-course; required of sophomores not electing French A1 and A2; 3 hours a week. Not given after 1907-1908. Credit 3 hours. Assistant Professor NEAL

II. Elective Courses

5 and 6. **Advanced German.**—To be announced.

A3 and A4. **Second-year and Scientific German.**—Sight reading in the class-room; the following and interpretation of easy colloquial German on the printed page as it is read by the instructor; the oral translation of spoken German; the writing of German from dictation. For work outside the class-room, students are assigned scientific primers in German, of which they must hand in written translations; and references are given later to various scientific periodicals, calling for the written translation of extracts or entire articles. Senior *double*-course; prerequisite, German A1 and A2. Not given after 1907-1908. Credit 4 hours. Assistant Professor NEAL

FRENCH

I. Required Courses

1 and 2. **Beginning French.**—Freshman *double*-course; required of all freshmen not offering French upon entrance; 4 hours a week. Credit 4 hours. Dr. ARMAGNAC, ——————

3 and 4. **Second-year French.**—Sophomore *double*-course; required of all sophomores who have taken French 1 and 2; open to freshmen who enter with a 1-year credit in French and a 2-year credit in German; 3 hours a week. To be first given in 1908-1909. Credit 3 hours. ——————

A1 and A2. **Elementary French.**—A beginning course. Sophomore *double*-course; required of sophomores not electing German A1 and A2; 3 hours a week. Not given after 1907-1908. Credit 3 hours. Dr. ARMAGNAC, ————————

II. Elective Courses

5 and 6. **Advanced French.**—To be announced.

A3 and A4. **Second-year French.**—Sophomore *double*-course; prerequisite, French A1 and A2; 4 hours a week. Not offered after 1907-1908. Credit 4 hours. Dr. ARMAGNAC, ————————

SPANISH

II. Elective Courses

1 and 2. **Beginning Spanish.**—Senior *double*-course; open to other than seniors upon special arrangement; 4 hours a week. Not given in 1907-1908. Credit 4 hours. ————————

3. Department of Political Science

[The aim of this Department is to introduce the student to such studies as may enable him to fulfil his social and political duties.]

I. Required Courses

2. **English and American History.**—The history of England is studied to the reign of Henry VIII, the history of England and the American colonies in conjunction to 1783, and thereafter the history of England and of the United States. Emphasis is laid on social and industrial history, but the more important political and religious movements are also treated. Lectures and textbooks; Cheyney's *Social and Industrial History of England* and Bogart's *Economic History of the United States.* Freshman course; 4 hours a week. Credit 4 hours. Assistant Professor HOLCOMB

3. **Economics.**—A course discussing such subjects as the resources of the various geographical divisions of our country in land and labor, the application of division of labor to agriculture, specialized and diversified farming, the large and the small farm system, tenure of farm lands, the distribution of farm products, tendencies toward agricultural coöperation, and those characteristics of agriculture which make it especially attractive to the liberally educated mind. Textbooks; reference reading and supplementary lectures; Fetter's *Principles of Economics* and Taylor's *Introduction to Agricultural Economics.* Junior course; 4 hours a week. Credit 4 hours.

Assistant Professor HOLCOMB

5b and 6. **Government.**—The English origins of American political institutions, the constitutional history of Massachusetts, laws relating to Massachusetts towns and town officers, the constitutional history of the United States, and the history of our political parties, with special studies of eminent political leaders and interpreters of the constitution; and a study of the United States Department of Agriculture, State Boards of Agriculture, and governmental provisions for agricultural education. Lectures and textbooks; Leacock's *Elements of Political Science* and Woodburn's *The American Republic*. Senior *course and a half*; 4 hours a week. Credit 4 hours.

Assistant Professor HOLCOMB.

Department of Mathematics, Physics, and Civil Engineering

Professor OSTRANDER, Associate Professor HASBROUCK,
Captain MARTIN.

Sections

1. Mathematics.
2. Physics.
3. Civil Engineering.

[This department gives instruction in mathematics, physics. and civil engineering. The aim is to secure thorough work in the fundamental principles of the subjects and to train students to clear and logical thinking. Application of the subjects to practical problems is given special attention.]

1. MATHEMATICS.

I. Required Courses

1. **Higher Algebra.**—Ratio and proportion, progressions, binomial theorem, series, undetermined coefficients, logarithms, continued fractions, theory of equations. Wells's *College Algebra*. Freshman course; 5 hours a week. Credit 5 hours.

Associate Professor HASBROUCK and Captain MARTIN

2. **Solid Geometry.**—Theorems and exercises. Wells's *Solid Geometry*. Freshman course; required of students not electing Zoölogy 2 or Chemistry 2b; 2 hours a week. Credit 2 hours.

Associate Professor HASBROUCK

4. **Plane Trigonometry.**—The essentials of the subject with applications of the theory to the solution of problems. Bowser's *Plane and Spherical Trigonometry*. Freshman course; 3 hours a week. Credit 3 hours. Associate Professor HASBROUCK.

II. Elective Courses

3. **Analytic Geometry.**—A discussion of the geometry of the line, the circle, of conic sections, and of the higher plane curves. Wentworth's *Analytic Geometry*. Junior-senior course; prerequisites, Mathematics 1, 2 and 4; 4 hours a week. Credit 4 hours.
Professor OSTRANDER

6. **Differential and Integral Calculus.**—A course based on Osborne's *Calculus*. Junior-senior course; prerequisites, Mathematics 1, 3 and 4; 4 hours a week. Credit 4 hours. Professor OSTRANDER

2. PHYSICS

I. Required Courses

1. **Elementary Mechanics and Heat.**—Text books, Dana's *Elementary Mechanics*, Carhart's *University Physics*. Sophomore course; 4 hours a week. Credit 4 hours. Associate Professor HASBROUCK

2. **Light and Electricity.**—Carhart's *University Physics*. Sophomore course; 4 hours a week. Credit 4 hours.
Associate Professor HASBROUCK

II. Elective Courses

3. **Analytic Mechanics.**—Advanced treatment of the subject by calculus. Bowser's *Analytic Mechanics*. Senior course; prerequisites, Mathematics 3 and 6 and Physics 1 and 2; 4 hours a week. Credit 4 hours. Professor OSTRANDER

4. **Laboratory Physics.**—Text-book, *Practical Physics* (Watson). Senior course; prerequisites Mathematics 3 and 6 and Physics 1, 2 and 3; 8 hours a week. Credit 4 hours. Associate Professor HASBROUCK

3. CIVIL ENGINEERING*

I. Required Courses

2. **Plane Surveying.**—The elements of the subject, including the adjustment and use of the usual instruments. Text-book and lectures. Sophomore course; prerequisites, Mathematics 1, 2 and 4; 6 hours a week. Credit 3 hours. Professor OSTRANDER

II. Elective Courses

3. **Hydraulics and Sanitary Engineering.**—A discussion of the principles of the subjects, especially with application to the problems of water-works and sewerage construction. Merriman's *Hydraulics*; lectures. Junior-senior course; prerequisites, Mathematics 1, 2 and 4, and Civil Engineering 2; 4 hours a week. Alternates with course 5; given in 1907–08. Credit 4 hours. Professor OSTRANDER

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* Announcements subject to change.

4. **Advanced Surveying.**—Topographic and higher surveying, highway construction, earthwork, pavements, and railroad construction. Text-book and lectures. Junior-senior course; prerequisites, Mathematics 1, 2 and 4 and Civil Engineering 2; 5 hours a week. Alternates with course 6; given in 1907–8. Credit 4 hours.
Professor OSTRANDER

5. **Stresses in Structures.**—An elementary course in roof and bridge stresses. Text-book and lectures. Junior-senior course; prerequisites, Mathematics 1, 2 and 4; 5 hours a week. Alternates with course 3; given in 1908-09. Credit 4 hours. Professor OSTRANDER

6. **Strength of Materials, Foundations and Masonry Construction.**—Text-book and lectures. Junior-senior course: prerequisites, Mathematics 1, 2 and 4; 4 hours a week. Alternates with course 4; given in 1908-09. Credit 4 hours. Professor OSTRANDER

Department of Military Science and Tactics

Captain MARTIN

[Under an act of Congress (July 2, 1862) military instruction under a regular army officer is required in this College of all able-bodied male students. Men are excused from the exercises of this Department only upon presentation of a certificate given by a resident physician; minor disabilities which might bar enlistment are not considered. Students excused from military duty may be required to take equivalent work. The object of the instruction is, to disseminate military knowledge in order that in emergency trained men may be found to command volunteer troops; but a further object is, to give physical exercise, to teach obedience without detracting from self-respect, and to develop the bearing and courtesy as becoming in a citizen as in a soldier.

Absences and other offences of military nature, and those of which the military instructor may take cognizance as affecting discipline, are dealt with by the Commandant in accordance with the regulations of the Department; but delinquencies in theoretical instruction not strictly military in their nature shall be dealt with in accordance with the rules of the Faculty.

Cadets in the graduating class who have shown special aptitude for military service are reported to the military secretary of the United States army and to the adjutant general of Massachusetts; in making appointments from civil life to the regular or volunteer army, preference is given to those who have been so reported. The names of the three most distinguished are published in the Official Register of the United States Army. Assignments to the band are made by the military instructor. Practise in the band is credited in place of drill and theoretical instruction.

A dark blue uniform, old army pattern, costing about $15.00, is worn by all cadets when on military duty, and may be worn at other times. The uniforms are procured through an authorized tailor. Cadets are required to be in uniform by November 1. The sale of old uniforms to members of an entering class is prohibited, unless the consent of the military instructor is obtained.]

I. Required Courses

1 and 2. **Introduction to Military Science and Tactics.**—Practical instruction in infantry drill regulations through the school of the battalion in close and extended order; advance and rear guards; outposts; marches; ceremonies; guard duty; target practise, in gallery and on the range. Upon the conduct and proficiency of this year depends the appointment of corporals for the ensuing year. Freshman *double*-course; 4 times a week. Credit 0 hours.

Captain MARTIN

3 and 4. **Practise and Theory of Military Science and Tactics.**—Practical instruction as before; pointing, aiming, and sighting drills; litter drills and first aid to the injured by detachment; target practise, in gallery and on the range. Theoretical instruction in infantry drill regulations, to include the school of the company; manual of guard duty; small arms firing regulations. Corporals are appointed from this class. On their conduct and proficiency depends the appointment of sergeants in the next class. Sophomore *double*-course; 4 hours of practise and 1 hour of instruction in theory a week. Credit 1 hour. Captain MARTIN

5 and 6. **Advanced Military Science and Tactics.**—Practical instruction as before; target practise, in gallery and on the range. Theoretical instruction: four exercises a week. Infantry drill regulations, to include the school of the battalion; advance and rear guards; outposts; marches and ceremonies; field service regulations; preparation of reports, returns, muster rolls, enlistment and discharge papers, rosters, requisitions, etc.; army regulations; lectures on military science. Sergeants are appointed from this class.

On their conduct and proficiency depends their selection as officers for the ensuing year. When necessary, officers will also be appointed from this class. Junior *double*-course; 4 hours of practise and 1 hour of theoretical instruction a week. Credit 1 hour.
Captain MARTIN

II. Elective Courses

7 and 8. **Higher Military Science and Tactics.**— Practical instruction as before; conduct of drills of lower classes; performance of officers' duties. Officers will as a rule be selected from this class. Cadets electing courses 7 and 8 must make the election for the year, and not later than the first Monday in June of their junior year. No cadet electing these courses will after the commencement drill be permitted to change his election without the consent of the Dean of the Faculty and of the Commandant. Senior *double*-course; 4 hours a week. Credit 2 hours. Captain MARTIN

PEDAGOGY

See DEPARTMENT OF AGRICULTURAL EDUCATION, p. 34.

PHYSICS

See DEPARTMENT OF MATHEMATICS, etc. p. 52.

Department of Rural Social Science

President BUTTERFIELD, Mr. LYMAN

II. Elective Courses

2. **The Rural Community.**—A study of the social status of the rural population, including their social condition, the movement to the cities, the social effects of rural life, and the social aspects of various agricultural questions, and of the social agencies in rural progress, such as means of communication, farmers' organizations, rural schools, means of agricultural education, rural religious institutions, and the federation of rural social agencies. Lectures, readings and essays on assigned topics. Junior-senior course; 3 hours a week. Alternates with course 4; to be given in 1907-1908. Credit 3 hours.
President BUTTERFIELD

4. **The Agricultural Industry.**—A brief study of the broad economic aspects of agriculture as an industry, its relation to other industries, its special characteristics as an industry, and present agricultural conditions; a special study of agricultural markets, transportation, agricultural business coöperation, agriculture and legislation; and notice of miscellaneous industrial problems. Lectures, readings, and essays on assigned topics. Junior-senior course; 3 hours a week. Alternates with course 2; to be given in 1908-1909. Credit 3 hours. President BUTTERFIELD

6. **Rural Law.**—This course treats of the laws relating to business, especially business associated with rural affairs; and of those relating to citizenship, domestic relations, farming contracts, riparian rights, real estate, and conveyancing. Lectures; practical work such as may fit one to perform the duties of a justice of the peace. Senior course; 1 hour a week. Credit 1 hour. Mr. LYMAN

SPANISH

See DIVISION OF THE HUMANITIES, p. 50.

Department of Veterinary Science

Professor PAIGE

[The courses in veterinary science have been arranged to meet the needs of students who propose following some kind of practical agriculture. Particular stress is laid upon the prevention of disease in animals. The needs of prospective students of human and comparative medicine have also been taken into account.]

I. Required Courses

Ia. **Introductory Bacteriology.**—The object of this course is to acquaint the student with the various organisms found in air, water, soil, milk, and the body, and with the relation of these organisms to such processes as decomposition, fermentation and digestion, and to the production of disease. Toxic-substances resulting from the growth of organisms, and the antitoxins used to counteract their action are considered. Lectures, recitations and laboratory work. Senior *half*-course; 6 laboratory exercises of 2 hours a week. Credit 3 hours. Professor PAIGE

II. Elective Courses

3 and 4. **Veterinary Science.**—A course treating of veterinary hygiene, comparative anatomy, and general pathology; veterinary materia medica and therapeutics; the theory and practise of veterinary medicine; general, special, and operative surgery; and veterinary bacteriology and parasitology. Lectures, clinics, demonstrations, and laboratory exercises. Senior *double*-course; 4 hours a week. Credit 4 hours.
Professor PAIGE

Department of Zoology and Geology

Professor C. H. FERNALD, Assistant Professor GORDON
Assistant Professor HOWARD

ZOOLOGY

I. Required Courses

2. **Physiology.** — The elements of anatomy and physiology; hygiene; sanitation, as related to sewage and garbage disposal, water supply, and construction of habitations; hygiene of transmissible diseases. Textbook and lectures; textbook, Hough and Sedgwick's *The Human Mechanism.* Freshman course; required of all students who do not offer physiology for entrance and pass that subject without condition; 4 hours a week. Credit 2 hours.
Assistant Professor GORDON

3. **Elementary Zoology.**—This forms the zoölogical part of an introductory course in biology. Laboratory dissection and lectures; laboratory text, Drew's *Invertebrate Zoölogy.* Sophomore course; one 2-hour laboratory period and 1 lecture hour a week. Credit 2 hours. Assistant Professor GORDON

II. Elective Courses

5 and 6. **General Zoology.**—General invertebrate zoölogy, with the exception of the insects; economic zoölogy. Textbooks, Parker and Haswell's *Textbook of Zoölogy* and Drew's *Invertebrate Zoölogy.* Junior *double*-course; prerequisite, Zoölogy 3 or its equivalent; three 2-hour laboratory periods and 1 lecture hour a week. Credit 4 hours. Assistant Professor GORDON

7, 8 and 9. **Advanced Zoology.**—See GRADUATE COURSES.

GEOLOGY

I. Required Courses

2a. **Determinative Mineralogy.**—A laboratory course in systematic determinative mineralogy based on Brush's *Manual of Geology*. The work consists in determining the minerals by a study of luster, fusibility, hardness, color, streak, specific gravity, etc., and by some of the simpler chemical tests. Junior *half*-course; 3 hours a week. Credit 2 hours. Assistant Professor HOWARD

2b. **General Geology.**—A study of rock-forming minerals, rock types, of structural, dynamical and superficial geology and of historic geology. Lectures; map and field work. General text-book, Scott's *An Introduction to Geology*. Junior *half*-course; 3 hours a week. Credit 2 hours. Assistant Professor GORDON

GRADUATE COURSES

LEADING TO THE DEGREES MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY

Applicants are eligible neither for the degree of Master of Science nor for that of Doctor of Philosophy until they have received the degree of Bachelor of Science or its equivalent.

Fuller information than that given below may be had from the Chairman of the Committee on Graduate Courses (see p. 16), whom all prospective graduate students should consult.

Courses for Degree Master of Science

A course of study in qualification for the degree of Master of Science is offered in each of the following subjects:

- Mathematics and physics
- Chemistry
- Agriculture
- Botany
- Horticulture
- Entomology
- Veterinary science

Upon the satisfactory completion of any two of these courses the applicant receives the degree. Candidates for this degree must devote, after graduation from college, not less than one year and a half to the prosecution of two of the above courses. At least one full academic year must be passed in residence at the Massachusetts Agricultural College.

Courses for the Degree Doctor of Philosophy

The degree Doctor of Philosophy is conferred upon candidates who have satisfactorily completed one major course of study and two minor courses. A course in botany, in chemistry, in entomology, or in horticulture may be selected as the major; minor courses may be taken in botany, chemistry, entomology, horticulture, and zoölogy. At least three years of graduate study in this College is necessary, 20 hours a week to be devoted to the major subject, and from 12 to 16 to be given to each minor during one year and a half.

General Outline of Courses for the Doctorate

a. Major Courses

Botany:

The following subjects in botany may be studied:

a. Vegetable physiology
b. Vegetable pathology
c. Mycology
d. Ecology
e. Taxonomy
f. Phylogeny
g. History of botany
h. History and theory of evolution

These subjects are pursued, to a greater or less extent, as the previous training of the student and the nature of the original problem undertaken may determine. The object of the course is to give the student a technical training in botany, to develop the spirit of research, and to lay a broad foundation in the subject. (As a supplement to this course, the student will do well to take, in addition to his prescribed minor work, a brief course in the history of philosophy and psychology.) Extensive reading of botanical literature, both general and specific, is required in certain subjects, and occasional lectures are given. A botanical conference is held monthly, in which various new problems of botanical science are considered by graduate students and the seniors who elect botany. A thesis dealing with some economic problem in plant physiology or pathology, or in both, and containing a distinct contribution to knowledge, is required.

Chemistry:

The following subjects in chemistry may be studied:

a. Inorganic analysis, qualitative (of the rarer elements), and quantitative
b. Crystallography
c. Physical chemistry
d. Descriptive and determinative mineralogy
e. Chemical geology
f. Soil formation
g. Soil physics and chemistry; gas analysis; synthetic inorganic work
h. Chemical theory and history
i. General organic chemistry
j. Special topics in organic chemistry
k. Elementary quantitative organic analysis
l. Proximate qualitative and quantitative organic analysis, including determination of organic radicles

m. Organic synthesis of aliphatic and aromatic compounds
n. Problems in chemical manufacture
o. Recent chemistry of plant nutrition
p. Animal physiological and pathological chemistry, including the chemistry of foods, of milk and milk industries, of urine, urinalysis, and the standards for feeding of all kinds
q. Toxicology
r. Insecticides and fungicides

Frequent examinations on current chemical literature are given. Early in the course original work on some chemical subject pertaining to agriculture must be begun. The history and results of this work must, before the awarding of the degree, be submitted in the form of a thesis containing a distinct contribution to knowledge.

Entomology :

The following subjects in entomology may be studied, with other work as indicated :

a. *General morphology of insects :* Embryology ; life history and transformations ; histology ; phylogeny and the relation of insects to other arthropods ; hermaphroditism ; hybrids ; parthenogenesis ; pedogenesis ; heterogamy ; chemistry of colors in insects ; luminosity ; deformities of insects ; variation ; duration of life.

b. *Ecology :* Dimorphism ; polymorphism ; warning coloration ; mimicry ; insect architecture ; fertilization of plants by insects ; instincts of insects ; insect products of value to man ; geographical distribution in the different faunal regions ; methods of distribution ; insect migrations ; geological history of insects ; insects as disseminators of disease ; enemies of insects, vegetable and animal, including parasites.

c. *Economic entomology :* General principles ; insecticides ; apparatus; special cases; photography of insects and their work; methods of drawing for illustrations ; field work on insects and study of life histories ; legislation concerning insects.

d. *Systematic entomology :* History of entomology, including classifications and the principles of classification ; laws governing nomenclature ; literature—how to find and use it ; indexing literature; number of insects in collections and in existence (estimated) ; lives of prominent entomologists ; methods of collecting, preparing, preserving, and shipping insects ; important collections of insects.

e. *Journal club:* Assignments of the literature on the different groups of insects to different students, who report at monthly meetings summaries of all valuable articles which have appeared during the month.

f. *Required readings:* The best articles on the various topics named above and on the different orders of insects, to cover from 15,000 to 20,000 pages, English, French, and German, the candidate to be examined at the close of his course on this with his other work.

g. *Thesis:* A thesis, illustrated with drawings, consisting of the results of original investigation upon one or several topics, and constituting a distinct contribution to knowledge, must be completed and accepted before the final examinations are taken.

Horticulture:

The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation, and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself to it continuously. He will be required to attend lectures, conferences, and seminars dealing with horticulture in its broader aspects, and to do advanced work in the following subjects:

a. Systematic pomology
b. Pomological practise
c. Commercial pomology
d. Systematic, practical, and commercial olericulture
e. Greenhouse plants and problems
f. Floriculture
g. Landscape-gardening
h. Plant breeding and general evolution
i. Questions of physiology connected with propagation and pruning

Other requirements and opportunities are (1) periodical seminars with special lectures by prominent men from outside the College; (2) extensive and systematically planned readings; (3) frequent visits, always with definite purpose, to orchards, gardens, greenhouses, estates, and libraries outside the College grounds; and (4) the preparation and publication of a thesis which shall set forth the results of the candidate's major study, and be an original and positive contribution to horticultural knowledge.

b. Minor Courses

Zoology :

Courses 7, 8, and 9 in zoölogy are together offered as a minor course to candidates for the degree of Doctor of Philosophy. They constitute an intensive course designed to give a broad outlook and to meet the needs of the specialist, and call for original investigation, laboratory dissection, technique, and museum work. The subjects treated and the work done will vary according to circumstances, but may be outlined thus :

a. General and comparative anatomy, both gross and microscopic ; entogeny and phylogeny ; life cycles, metamorphosis, and metagenesis ; animal associations, colonial, commensal and parasitic, and symbiotic associations of animals and plants ; adaptation, adaptive radiation and parallelisms
b. Geologic, geographic, and bathymetric distribution of animals
c. Systematic zoölogy, including paleozoölogy ; museum and field technique
d. Economic zoölogy
e. History and development of zoölogical science
f. Weekly seminar and and journal club meetings, in which all advanced students of zoölogy take an active part
g. Collateral reading ; general knowledge of current zoölogical literature

Other Subjects :

Courses in the other subjects open to choice as minors will be outlined according to the qualification and needs of the students applying for them.

SHORT COURSES

Summer School

Purposes and Methods:

The Summer School of Massachusetts Agricultural College was organized in 1907 under an act of the legislature authorizing a Normal Department at the College. The intention is to train teachers in elementary agriculture and nature study so that in the schools of the state these subjects may be most effectively presented. For 1908, the plan of work is considerably broader; courses are now in preparation designed to help the teachers in nearly all grades. There are courses especially designed for (a) grade teachers, (b) high-school teachers, (c) preachers, and (d) persons interested in elementary and technical agriculture. Most of the instruction is given out of doors in demonstrations, practicums, and observation exercises. Instructors are chosen from the Faculty of Massachusetts Agricultural College and elsewhere.

Summer School Faculty (1907):

KENYON L. BUTTERFIELD, A. M.,
President of the College

FRANK A. WAUGH, M. S.,
Dean of the Summer School

EDWARD A. WHITE, B. SC.,
Director and Instructor in Plant Life

E. H. SCOTT, B. S.,
Registrar and Instructor in Plant Culture

JAMES B. PAIGE, B. S., D. V. S.,
Instructor in Domestic Animals

WILLIAM R. HART, A. M.,
Professor of Agricultural Education

PHILIP EMERSON,
Instructor in Methods

CLARENCE MOORES WEED,
Instructor in Insect Life

E. H. FORBUSH,
Instructor in Bird Life

H. D. HEMENWAY, B. SC.,
Instructor in School and Practical Gardening

Summer Courses of Study:

The following courses are offered for the summer of 1908:

SS 1. *Agricultural Education*—A course designed to show the methods of agricultural and industrial teaching, and the pedagogic basis on which such instruction is given; 5 exercises weekly, 4 weeks.
Professor Hart

SS 2. *High School Agriculture.*—The organization of high schools for the teaching of agriculture; equipment and courses of study. Lectures and practicums; 5 exercises weekly, 4 weeks.
Professor Hart

SS 3. *High-school Chemistry.*—Courses of study and equipment for general high-school chemistry, with special reference to agriculture and the industries; 5 exercises weekly, 4 weeks.

SS 4. *Soils and Tillage.*—The chemical, physical and biological composition of the soil and the relation of each to plant growth; the formation of soils; natural and artificial sources of fertility; methods and implements of tillage: all forming an introduction to modern scientific agriculture; 5 exercises weekly, 2 weeks.
Professor Foord

SS 5. *Field Crops.*—Modern methods of managing the principal field crops of New England, such as grasses, clovers, corn, and potatoes. Class-room and field work; 5 exercises weekly, 2 weeks.

SS 6. *Domestic Animals.*—The different breeds of horses, cattle, swine and poultry; modern methods of care, sanitation, breeding and feeding. The course is especially adapted to the needs of those who have an amateur interest in live stock; 5 exercises weekly, 4 weeks.
Mr. Gribben

SS 7. *Practical Gardening.*—This course will consist almost wholly of practical field exercises in planting, training, cultivation, etc.; 5 exercises weekly, 4 weeks. Mr. Tompson

SS 8. *Gardening Investigations.*—A course especially designed to give a new point of view with reference to agriculture and nature-study methods. Suited to advanced teachers; 5 exercises weekly, 4 weeks. Professor Waugh

SS 9. *Trees and Shrubs.*—A practical course in arboriculture, involving study of native and exotic trees and shrubs, and their identification, propagation, and culture; largely field work; 3 exercises weekly, 4 weeks. Assistant Professor White

SS 10. *Floriculture.*—This course deals with hardy, annual and perennial plants and with house plants; 2 exercises weekly, 4 weeks.
Assistant Professor White

SS 11. *Plant Life.*—Elementary experiments in plant life with home-made apparatus, and discussion of the classification of plants; special study of ferns; 5 exercises weekly, 4 weeks.
Professor Stone and Assistant Professor Osmun

SS 12. *Bird Life.*—A course specially concerned with the economic relations of birds; 5 exercises weekly, 2 weeks.

SS 13. *Insect Life.*—This course is planned with special reference to the school study of economic insects; 5 exercises weekly, 2 weeks.

SS 14. *Nature Study Drawing.*—A drawing course for teachers who wish to make greater use of drawing lessons in handling nature subjects; 5 exercises weekly, 4 weeks. Mr. Gracey

SS 15. *Forestry.*—Forest species, forest composition, regeneration, management, exploitation, etc.; mostly field exercises; 4 exercises weekly, 2 weeks. Assistant Professor White

SS 16. *The Agricultural Industry in New England.*—An outline of the agricultural situation and prospects in New England and of the farmer's business problems.

SS 17. *Agricultural Economics.*—A survey of the agricultural industry and its relation to other industries. The lectures will take up a description of national and world conditions in agriculture.

SS 18. *The Social Aspect of Agriculture.*—The relation of the country church to the rural problem is especially considered in this course; 5 exercises weekly, 2 weeks. President Butterfield

Short Winter Courses

These courses are open to men and women. Applicants must be at least sixteen years of age, and must furnish papers certifying good moral character. No entrance examination is necessary. Tuition is free to citizens of the United States. The same privileges in regard to room and board obtain as with other students. Attendance upon chapel is required. The usual fees are charged for apparatus and material used in laboratories. Attendance upon military drill is not expected.

Dairy Farming:

Begins the first Wednesday in January and continues ten weeks.

	Hours a week
Soils, tillage, and methods of soil improvement; manures and fertilizers and their use; crops and rotations	4
Breeds and breeding of dairy stock; judging to scale of points	2
Fodders and the feeding of farm live stock	1
Stable construction and sanitation	1
Common diseases of stock; prevention and treatment	1
Dairy products, their general characteristics	1
Chemistry of the dairy farm; lectures and laboratory; Snyder's *Chemistry of Plant & Animal Life*, Warrington's *Chemistry of the Farm*, Farrington & Woll, *Testing Milk and Its Products*	5
Botany	1
Horticulture	2
Entomology	3
Dairy practice, including testing, use of separators, buttermaking, preparation of certified and modified milk, and pasteurization	4
Practise in floriculture	1

Bee Culture:

This course will be given, if applied for by at least six students, beginning the fourth Wednesday in May and continuing two weeks. Lectures by specialists will be included. It will include the work outlined in the following summary:

	Total hours
The structure of bees, with special reference to their work Prof. H. T. FERNALD	3
Flowers and fruits in their relation to bees Professor STONE	5
Honey crops and how to grow them Professor BROOKS	5
Bees and bee-keepers' supplies Professor PAIGE	10
Work in the apiary, under the direction of an expert	20

GENERAL INFORMATION

A. Financial and administrative matters
B. Academic and departmental matters

A. FINANCIAL AND ADMINISTRATIVE

Student Expenses

Tuition :

Tuition is free to citizens of the United States ; but students who are citizens of Massachusetts should apply to the senator of the district in which they live for a free scholarship. Blank application forms may be obtained from the Registrar. The tuition charged persons not citizens of the United States is $120 a year.

Dormitories and Board :

Students occupy rooms in the College dormitories unless excused. The rooms are unfurnished and are arranged in suites of three—one study room and two bedrooms. They are heated with steam and lighted with electricity. Students care for their rooms themselves. The rent for each person ranges from $31.50 to $66.00 a year according to building and location of room. In Draper Hall (the dining hall) rooms are provided for women students ; the rental is $30 a semester for each person. Correspondence about rooms should be addressed to the Dean.

Board can be had at the College dining hall. At present it costs $3.75 a week, but this price changes when the cost of board changes.

Fees :

Fees, payable in advance, are charged for the use of the laboratories for semesters in which the student does or is expected to do laboratory work. These fees are, for each semester :

Chemical laboratory,	$15.00
Zoölogical laboratory, Sophomore year,	2.00
Other years,	4.00
Entomological laboratory (2 hours a week),	3.00
Botanical laboratory (2 hours a week),	1.00

Other periods in proportion.

Total Estimated Expenses:

The necessary college expenses of students are estimated as follows:

	Low	High
Tuition—		
Citizens of Massachusetts (free through state scholarships)		
Other citizens of the United States free		
Foreigners, $120 a year		
Room	$ 31.50	$ 66.00
Board, $3.75 to $4.50 a week..............	135.00	162.00
Washing, 50 cents to 75 cents a week	18.00	27.00
Military uniform.........................	15.00	20.00
Miscellaneous expenses	50.50	75.00
	$250.00	$350.00

Student Aid

Self Help:

A large number of students find opportunities for earning money without depending on the labor fund, and many rely upon labor to earn their way through college. A few men have paid all their way through college; a great many more have paid a large part of their expenses: and many have earned a small proportion of the cost of their course. But the College recommends that no new student enter without having at least $100—better $150—with which to pay his way until he can establish himself at work. The College does not encourage students to enter without money in the expectation of earning their way. The ordinary student will find it better either to work and accumulate money before coming to college or to take more than four years in college, or instead to borrow money with which to complete his course. No student should undertake work that interferes with his studies, and students should consider that, owing to the large number of applications for labor-fund employment no one man can receive a large amount from that source.

Labor Fund:

An annual appropriation of $5000 for student labor is received from the state. This fund is used only in assisting students who are citizens of Massachusetts and dependent entirely or in part on their own exertions. So far as possible such students will be employed in some department of the College. The Department of Agriculture and the Department of Horticulture usually afford the most work. Application for student labor should be made directly to the President. Applicants must present a certificate signed by parent or guardian and by one of the selectmen of the town in which they reside, showing that they need the aid. Students whose deportment or class work is not satisfactory are not likely to be continued in student labor.

The income from another $5000—a gift—is also used for the employment of deserving students.

B. ACADEMIC AND DEPARTMENTAL

Degrees

Those who complete the four-years course receive the degree Bachelor of Science. Those who receive this degree may also, upon payment of a fee, receive the degree of Bachelor of Science from Boston University (see p. 7); but the candidate must meet the conditions imposed by the University concerning preparatory studies.

Graduate students who complete the assigned courses will receive the degree Master of Science (fee, $10). Credit may sometimes be allowed toward this degree for teaching or other advanced work done in some Department of the College.

Graduate students who complete the required three-years course of study and present a satisfactory thesis will be granted the degree Doctor of Philosophy (fee, $25).

Those to whom degrees are awarded must present themselves in person at commencement to receive them. Honorary degrees are not conferred.

Fellowships, Scholarships, and Prizes

Fellowship:

A teaching fellowship under the title Instructor in Chemistry is given a recent graduate who desires to do advanced study.

Scholarships:

The income of gifts from different persons is distributed in scholarships to worthy students requiring aid. The funds supporting these scholarships are:

1. The Mary Robinson fund of $1000, the bequest of Miss Mary Robinson, of Medfield.
2. The Whiting Street fund of $1000, the bequest of Whiting Street, of Northampton.
3. The Henry Gassett fund of $1000, the bequest of Henry Gassett, of North Weymouth.

Prizes :

Prizes are given annually in several Departments for excellence in study or for special achievement. The prizes offered for the year 1908-1909 are :

Agriculture.—The Grinnell prizes (first, $25, second, $15), given by Hon. William Claflin of Boston, in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who pass the best and second best examinations, oral and written, in theoretical and practical agriculture.

Botany.—The Hills prizes (amounting to $35), given by Henry F. Hills, of Amherst, will be awarded to members of the senior class as follows : For the best herbarium, $15 ; for the best collection of Massachusetts trees and shrubs, $10 ; for the best collection of Massachusetts woods, $10. No collection deemed unworthy of a prize will be considered.

English.—The Flint prizes (first, $30 ; second, $20) are awarded under certain restrictions to those members of the junior class delivering the best and second best oration. Both composition and delivery are considered in making the award. The Flint contest takes place in commencement week.

The Burnham prizes in English (amounting to $80), given by the late T. O. H. P. Burnham of Boston, are awarded as follows : (1) To sophomores, for excellence in competitive essay writing, three prizes, namely : First, $20 ; second, $10 ; third, $5. Only those may compete who have a grade of 80 or higher in the sophomore courses in English. (2) To freshmen, for excellence in declamation, two prizes, namely : First, $25 ; second, $20. The speakers are chosen through a series of competitions. The final Burnham contest in declamation takes place in commencement week.

Entomology.—Professional entomologists among the alumni of the College offer two prizes for the best work done in entomology by undergraduates. The prizes ($20 and $10) are awarded by the Department of Entomology according to a scale of points announced in advance.

Forestry.—The J. D. W. French prize ($25) is given by the Bay State Agricultural Society to that member of the senior class who writes the best essay on Forestry.

Two prizes (first, $15; second, $10) are offered by a friend of the College to those members of the senior or the junior class who write the best essays on the management of a farm wood-lot.

General Improvement.—The Western Alumni Association prize ($25) is offered to that member of the sophomore class who during his first two years in College has shown the greatest improvement in scholarship, character, and example.

Winter Course Prizes for 1908.—No prizes are offered permanently to students taking the short winter courses, but for the year 1908 the following prizes are offered:

1. Given by the Massachusetts Society for Promoting Agriculture: (a) For general excellence, three prizes, $50, $30, and $20; (b) for the best butter made by students, three prizes, $25, $15, and $10; (c) for excellence in stock judging, four prizes: $10, $7.50, $5, and $2.50.
2. Given by the Bowker Fertilizer Company, Boston: For the best essay on the use of fertilizers on the dairy farm, one-half ton of Stockbridge fertilizer.
3. Given by B. von Herff, of the German Kali Works, New York City: For the best essay on the use of fertilizers, one ton of kainit or its equivalent in money.

Military Diplomas:

Military diplomas are given to those men receiving the degree of Bachelor of Science who by their work in the Department of Military Science have shown themselves worthy of distinction. These diplomas recommend those receiving them for commissions in the United States army or the militia of the several states.

Equipment

Agriculture:

The part of the College land assigned to the Department of Agriculture contains 160 acers of improved land, 56 acers of pasture, and a 16-acer woodlot. The new barn, stables, and farm dairy are models in arrangement and convenience and illustrate the best methods of sanitation. They are stocked with the best breeds of horses, cattle, and swine. The latest inventions in agricultural tools and machinery are in practical use. The general management is that of the modern dairy farm, and the farm illustrates upon a commercial scale the best methods of crop production and of maintenance of soil fertility. It is to a considerable degree devoted to demonstration experiments upon a large scale. It has been brought to a high degree of productiveness and is capable of carrying a stock of 100 cattle, 30 horses and colts, and 75 head each of sheep and swine, besides annually affording for sale from 25 to 50 tons of hay, from 1000 to 3000 bushels of potatoes, and numerous other products.

Three large rooms are equipped with the latest machinery driven by an electric motor, and are used in the instruction in dairy operations. A museum contains a collection of implements, seeds, plants, and models of animals, all illustrating the science and practise of agriculture. The laboratory is provided with a full line of highly improved apparatus for the study of the physical properties and the mechanical analysis of soils. Space is provided for the indoor study of farm-machinery in motion. A dynamometer for determining the draft of machines and implements; surveying instruments for use in solving drainage problems; and microscopes and germination apparatus for use in seed examination, are among the important accessories.

Botany:

The Department of Botany occupies Clark Hall, a brick building 55 x 95 feet, two stories high, with basement and attic. It has two lecture rooms, one seating 154 and the other seating 70 people; one seminar room; a large laboratory for freshman and junior work, and one for senior work; and three rooms specially fitted for graduate students. The Experiment Station laboratories devoted to botanical research are also in this building. A small museum contains material especially useful in the teaching and illustration of plant phenomena; and on the third floor is a collection of Massachusetts timber trees, specimens showing peculiar formations of plant growth, and various specimens illustrative of scientific methods of treating trees.

The laboratories and lecture rooms are of modern construction, finely lighted, and supplied with all necessary conveniences. The basement contains a bacteriological laboratory; a seed and soil room; and a convenient workshop provided with benches for wood and metal work, an electric motor, a power lathe, and other tools and appliances. In the senior laboratory is a room designed especially for physiological work; this laboratory is well supplied also with apparatus for the study of simple phenomena in plant physiology, such as respiration, matabolism, transpiration, heliotropism, etc. The herbarium contains 15,000 species of flowering plants and ferns, 1,200 sheets of mosses, 1,200 sheets of lichens and liverworts, and about 12,000 sheets of fungi. The laboratory is equipped with 85 modern compound microscopes and a number of dissecting microscopes, microtomes, and a large series of charts. A small conservatory and aquaria-room is to be built; it will have direct connection with the building.

Chemistry:

The Department of Chemistry has rooms adapted to chemical uses, supplied with a large assortment of apparatus and chemical materials. The lecture-room on the second floor seats 70 students. Immediately adjoining it are four smaller rooms for apparatus and the preparation of materials for the lecture table. The laboratory for beginners is furnished with 40 working-tables. Each table is provided with reagents and apparatus for independent work. A well-equipped laboratory for advanced work is also provided. The weighing room has 6 balances and improved apparatus for determining densities of solids, liquids, and gases. The equipment includes also a miscoscope, a spectroscope, a polariscope, a photometer, a barometer, numerous models, and an extensive collection of industrial charts, and there is a valuable and growing collection of specimens and samples. The latter includes rocks, minerals, soils, raw and manufactured fertilizers, foods, milk products, fibers, various other vegetable and animal products, and artificial preparations of mineral and organic compounds. With this should also be mentioned a series of preparations used for illustrating the various stages of different manufactures, from raw material to finished product.

Dining Hall:

Draper Hall, the College commons, is a brick colonial building, equipped with the modern conveniences of a dining hall. It was opened in February, 1903 and is under the supervision of a committee composed of two members of the Faculty, two members of the student body, and the steward. The hall contains a number of suites of rooms reserved for women students.

Drawing:

Two rooms on the second floor of Wilder Hall are occupied by the classes in drawing. They are equipped with tables and adjustable drawing stands. The necessary materials and implements are provided. The equipment includes drawing models, and plaster casts of leaves, flowers, fruits, human and architectural details, and garden ornaments, two universal drafting machines, an eidograph, centrolineads, a set of ship splines and French curves, complete water color outfits, automatic crosshatchers, and protracters. A small reference library is collecting, additions being made to it from time to time. The apparatus of the Landscape-gardening Department is used also by the drawing students.

Entomology:

Entomological laboratory: The equipment for work in entomology for seniors and for graduate students is unusually good. The laboratory building contains a large room for laboratory work, provided with tables, dissecting and compound microscopes, microtomes, reagents, and the usual laboratory implements. One part of the building is fitted up as a lecture room. Another part is devoted to library purposes, and contains a card-catalogue of nearly 50,000 cards, indexing the literature on insects. Besides the well selected list of entomological works in this room, there are in the College Library an unusual number of rare and valuable books on this subject. These libraries are supplemented by the private libraries of the professors in charge, which contain more than 25,000 volumes, many of which cannot be found elsewhere in the United States. In another room is a large and growing collection of insects, both in the adult and in the early stages. As the laboratory is associated with the insectary of the College Experiment Station, the facilities of the latter are directly available. The apparatus room of the insectary, with its samples of spray pumps, nozzles, and other articles for the practical treatment of insects; the chemical room, fitted for the analysis of insecticides and for other chemico-entomological work; and a greenhouse where plants infected with injurious insects are under continual observation and experimental treatment, are all open to the student; and in addition are provided several private laboratory rooms and a photographing room with an unusually good equipment of cameras. The large greenhouses, grounds, gardens, and orchards of the College provide further for study under natural conditions of a wide range of subjects relating to injurious insects.

Floriculture :

The Department of Floriculture aims to give the student a thorough knowledge of all phases in the culture of florists' crops. It is intended to train men for commercial floriculture and for the management of conservatories on private estates. With this training in view, the course is outlined to combine theoretical, technical, and practical work in the most comprehensive manner possible. The Department has several large houses well stocked with materials for class demonstration and for practical work by students. These houses contain palms, ferns and other exotics, carnations, roses, and chrysanthemums. There are also houses suitable for growing bedding plants, and frames for growing violets and pansies. Many excellent specimens of trees, shrubs, and herbaceous perennials grow on the college grounds, furnishing valuable material for the study of arboriculture.

Geology :

The teaching in geology is illustrated with a very complete series of minerals, the state collection of rocks of Massachusetts, a series of Ward's fossils and casts of fossils, and models and charts.

Heating, Lighting, and Power :

The College supplies its own light, heat, and power, including electricity for the night-lighting of the campus and its approaches. The machinery of the barn, the dairy, and other buildings is operated by electricity generated at the power-house. The College has also a machine-shop.

Landscape-Gardening :

The work in landscape-gardening is developed in a strong technical four-years course ; the first two years are occupied with required studies, including botany, horticulture, surveying, and mathematics, and the last two years are devoted to more specialized studies in landscape gardening, arboriculture, floriculture, entomology, botany, and mathematics. The environment is unusually favorable. The strictly technical work in landscape-gardening is taught in light and comfortable drafting-rooms fully furnished with instruments and accessories for exacting work. There is a well selected library, and the equipment of surveying and drafting instruments is unusually complete and practical.

Library :

The Library occupies the lower floor of the Library-Chapel building. It contains nearly 28,000 books. Among these, scientific treatises predominate, but history, economics, and literature are well represented. Indeed, the Library has grown so rapidly that additional room has become necessary. A reading-room supplies good periodicals.

The building itself is one of the most attractive belonging to the College. It stands commandingly in the group of buildings along the western side of the campus. The larger part of the second story is occupied by the large chapel, a room which seats about 400 and is the general assembly room for college exercises. It contains an excellent pipe organ. Two adjoining rooms, which can be thrown open as a part of the main hall, are used for smaller gatherings.

Market-Gardening :

Ten acers of land are at the disposal of the Market-gardening Section. On this, all the important kinds of market-garden crops are grown. A large equipment of horse and hand tools are at hand, and improved implements are constantly added to it. Hot-beds and cold-frames are kept in season, and the student has the opportunity to observe the most common forcing method of gardens. Connected with the greenhouses is a lettuce house, and plans have been made for the erection of two ranges of greenhouses which are to include lettuce, tomato, and cucumber houses. The course in market-gardening is given in the well equipped rooms of Wilder Hall. Practical exercises in the field supplement the class-work.

Mathematics, Physics and Engineering :

Surveying: The Department has a considerable number of the usual surveying instruments, with the use of which the students are required to become familiar by doing field work. Among the larger instruments are 2 plain compasses, a railroad compass with telescope, a surveyor's transit, 2 engineer's transits with vertical arc and level, a solar compass, an omnimeter with verniers reading to 10 seconds, adapted to geodetic work, a Queen plane table, 2 wye levels, a dumpy level, a builder's level, a sextant, a hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For drafting, a vernier protractor, a pantograph, a parallel rule, etc., are available. The Department also has a Fairbanks cement testing outfit.

Physics: Among the apparatus in use for instruction in general physical processes are a set of United States standard weights and measures, precision balances, a spherometer, vernier calipers, etc.; in mechanics, systems of pulleys and levers, apparatus to illustrate the laws of falling bodies and motion on an inclined plane, and the phenomena connected with the mechanics of liquids and gases. The Department is equipped with the usual apparatus for lecture illustration in heat, light and sound; in electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, including a full set of Weston ammeters and volt meters, a Carhart-Clark standard cell, a Mascart quadrant electrometer, a Siemens electro-dynamometer, and reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistances.

Military Science:

This Department makes use of the campus for battalion drill, and has a special building in which there is a drill room 60 by 135 feet, an armory, a recitation room, an office for the Commandant, a field-gun and gallery practise room, and a large bathroom. The national government supplies Krag-Jorgensen rifles with complete equipments and ammunition. The state supplies instruments for the College band. Students are held responsible for all articles of public property while in their possession.

Pomology:

The Department of Pomology has ten acers of orchard including apple, pear, peach, plum, cherry and quince trees. Of particular interest is the large collection of these fruits on the various dwarf stocks, showing many types of training. The recent revival of interest in dwarf fruits makes these dwarf orchards of especial value to students. There is also a commercial vineyard and a smaller one: in these are shown the principal types of trellis and the leading methods of training grapes. Several acers are used in growing the various kinds of small fruits, such as strawberries, raspberries, blackberries, currants, and gooseberries. There are also extensive nurseries, where all of these various types of fruits are grown, in which students may see them in all stages of development.

The Department has a good equipment of orchard and nursery tools of all the principal types, the use of which enables students to learn the value of each type. For other orchard operations, such as spraying and pruning, the most approved makes of pumps, nozzles, pruning saws, knives, etc., are provided. For laboratory work in systematic pomology there is a collection of more than 100 wax models of apples and plums in natural colors, which are particularly valuable in identifying varieties of these fruits unknown to the student. The laboratory is also furnished with a large number of reference books on pomology; and fruit in a fresh condition is available in great variety not only from the College orchards but from other parts of Massachusetts and from many other states. In 1907-1908, for instance, apples for class use were received from British Columbia, Ontario, Quebec, Nova Scotia, Iowa, West Virginia, Wisconsin, Michigan, Connecticut, New York, Oklahoma, Kansas, Colorado, Oregon, California, Maryland, Delaware, and Kentucky.

Veterinary Science and Bacteriology:

The Department of Veterinary Science and Bacteriology occupies a modern laboratory and hospital-stable, both built (in 1899) in accordance with the latest principles of sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation, and disinfection.

The main building contains a large working laboratory for student use, and several small private laboratories for special work. There are a lecture-hall, a museum, a demonstration room, a photographing room, and a work shop. The hospital-stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a poultry section, a section for cats and dogs, and 6 sections, separated from each other, for horses, cattle, sheep, and swine. The laboratory equipment consists of a dissectible Auzoux model of the horse, and Auzoux models of the foot and the leg, showing the anatomy and the diseases of every part. The laboratories also have modern high power microscopes, microtomes, incubators, and sterilizers, for work in bacteriology and parasitology. There are skeletons of the horse, the cow, the sheep, the dog, and the pig, and a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts and diagrams.

Zoology:

A large and well lighted room in the South College is equipped as a zoölogical laboratory. It has the best apparatus, consisting of microscopes, both simple and compound, a microtome, a paraffin bath, an incubator, dissecting instruments, and other necessary apparatus and reagents. A reference library which includes the current zoölogical and geological journals is kept in this room, and there are ample aquaria in which living aquatic forms may be studied.

The lecture-room is a large room in South College. It is supplied with an electric projection lantern, a set of Leuckart charts, various special charts, and a complete set of Auzoux models illustrative of human and comparative anatomy. A special set of topical specimens is used for class illustration, and the more extensive museum collection is drawn upon for the same purpose.

The museum is relied on mainly for specimens illustrating the forms treated of in the lecture and the laboratory courses. In addition to this, the aim has been to show as fully as possible the fauna of Massachusetts, and types that show especially the evolution and the relationship of the members of the animal kingdom. The collection consists of more than 11,000 specimens. The museum is open to the public from 3:30 to 5:30 p. m. each week day. The Curator is Assistant Professor Gordon.

Religious Services

Chapel services are held four mornings a week. On Wednesday, instead of chapel an afternoon assembly is held, for which an attempt is made to secure speakers who will present important current subjects. Students are required to attend chapel and assembly.

The Young Men's Christian Association of the College holds a short religious meeting in the chapel on Thursday evenings. For part of the year the College and the Y. M. C. A. unite in Sunday Vespers, held in the chapel. At vespers a prominent clergyman or layman speaks.

Student Organizations

Musical Organizations :

The musical organizations comprise the student orchestra, a mandolin club, and a double-quartet glee-club. These organizations are under the supervision of the Faculty; they plan definite direction of the musical interest and ability among the students. A limited number of entertainments outside of Amherst are given. A military band is maintained as part of the cadet corps.

Scientific Organizations :

The *College Chemical Club* was organized to bring students of chemistry into closer relationship. Each member is required to read an original paper at least once a year. Seminars are held and outside speakers are invited to address the club and to discuss with the chemistry class whatever questions may come up in their class-room work.

The *Stockbridge Club* is an organization of students specially interested in practical agriculture, horticulture, and floriculture. Regular meetings are addressed by outside speakers and members present papers and engage in discussions.

An *Entomological Journal Club* and a *Zoölogical Club* are also maintained.

HONORS AND AWARDS.

Prizes: 1906-1907

The Grinnell Agricultural Prize:

To those members of the senior class who produce the best and second best examinations, oral and written, in theoretical agriculture.

First prize, $40, to James Hervey Walker.
Second prize, $20, to John Thomas Caruthers.

J. W. D. French Prize in Arboriculture:

To the writer of the best essay on the street trees of Amherst.

First prize, $25, to Orton Loring Clark of the junior class.

Hills Botanical Prize:

For the best general herbarium, $15, to Ralph Jerome Watts.

Burnham Prizes in English:

To *freshmen*, for excellence in public declamation.

First prize, $25, to Louis Brandt.
Second prize, $20, to Allen James Robb.

To *sophomores*, for excellence in competitive essay-writing.

First prize, $20, to Myron Francis Geer.
Second prize, $10, to Charles Sumner Putnam.
Third prize, $5, to George Murray Brown, Jr.

Flint Prizes in English:

To members of the junior class who produce the best and second best orations.

First prize, $30, to David Larsen.
Second prize, $20, to Thomas Addis Barry.

Entomological Prize:

Given by graduates of the College working in entomology to the two members of the senior class taking that subject who have most fully satisfied certain requirements of work indicated by the donors.

First prize, $20, to Arthur Huguenin Armstrong.
Second prize, $10, to Robert Poland Wood.

Forestry Prize:

Given by a friend of the College to those members of the senior or the junior class writing the best essay on the subject of the "Origin, prevention, and extinguishing of fires on farm wood-lots."

First prize, $25, to Fred Alexander Watkins, senior class.
Second prize, $15, to Joseph Otis Chapman, senior class.

The Western Alumni Association Prize:

To that member of the sophomore class who during his two years in college has shown the greatest improvement in scholarship, character, and example.

$25, to Myron Wood Thompson.

Military Honors

The following cadets, members of the senior class, were reported to the Adjutant General of the United States Army and to the Adjutant General of Massachusetts, as showing special aptitude for military service:

Walter Ebenezer Dickinson
John Nicholas Summers
Frederick Charles Peters
Ralph Jerome Watts

DEGREES CONFERRED

1907

DOCTOR OF PHILOSOPHY

Back, Ernest Adna	Florence

MASTER OF SCIENCE

Ladd, Edward Thorndike	Winchester

Total, 2.

BACHELOR OF SCIENCE

Armstrong, Arthur Huguenin	Hyde Park
† Bartlett, Earle Goodman	*Chicago, Ill.*
†*Caruthers, John Thomas	*Columbia, Tenn.*
† Chace, Wayland Fairbanks	Middleboro
† Chapman, George Henry	*Wallingford, Conn*
†*Chapman, Joseph Otis	Brewster
† Clark, Milford Henry Jr.	Sunderland
† Cutter, Frederick Augustus	*Pelham, N. H.*
†*Dickinson, Walter Ebenezer	North Amherst
†*Eastman, Jasper Fay	Townsend
*Hartford, Archie Augustus	Westford
Higgins, Arthur William	Westfield
†*King, Clinton	Dorchester
Livers, Susie Dearing	Boston
*Parker, Charles Morton	Newtonville
† Peters, Frederick Charles	Lenox
†*Shaw, Edward Houghton	Belmont
†*Summers, John Nicholas	Brockton
†*Thompson, Clifford Briggs	Halifax
† Walker, James Hervey	Greenwich Village
† Watkins, Fred Alexander	West Millbury
†*Watts, Ralph Jerome	Littleton
† Wood, Herbert Poland	Hopedale

Total, 26.

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* Degree of Boston University.

† Military Diploma.

ROLL OF STUDENTS

GRADUATE STUDENTS

Candidates for a Degree

Armstrong, Arthur Huguenin	Hyde Park	Nutting Ave.
B. Sc. Massachusetts Agricultural College, 1907		
Bartlett, Earle Goodman	*Chicago, Ill.*	69 So. Pleasant St.
B. Sc. Massachusetts Agricultural College, 1907		
Franklin, Henry James	Bernardston	6 Phillips St.
B. Sc. Massachusetts Agricultural College, 1903		
Hooker, Charles Worcester	Amherst	5 North East St.
B. A. Amherst College, 1906		
Shaw, Jacob Kingsley	North Amherst	North Amherst
B. Sc. University of Vermont, 1899		
Summers, John Nicholas	Campello	66 Pleasant St.
B. Sc. Massachusetts Agricultural College, 1907		

Total, 6.

Not Candidate for a Degree

Turner, James Arthur	Springfield

Total, 1.

SENIOR CLASS

Allen, Charles Francis	Worcester	96 Pleasant St.
Anderson, John Albert	North Brookfield	17 South College
Anderson, Kenneth French	Roslindale	1 South College
Bailey Ernest Winfield	Worcester	Kappa Sig. House
Bangs, Bradley Wheelock	Amherst	29 Lincoln Ave.
Barry, Thomas Addis	Amherst	20 South College
Bartholomew, Persis	Melrose Highlands	Draper Hall
Bates, Carleton	Salem	Kappa Sig. House
Chapman, Lloyd Warren	Pepperell	4 South College
Chase, Henry Clinton	Swampscott	5 South College
Clark, Orton Loring	Malden	Dr. Stone's
Cobb, George Robert	Amherst	33 Cottage St.

Coleman, William John	Natick	Plant House
Cummings, Winthrop Atherton	Bondsville	Thompson House
Cutting, Leroy Edward	Amherst	Whitney St.
Daniel, John	Osterville	4 South College
Davenport, Stearnes Lothrop	North Grafton	8 South College
Davis, Paul Augustin	Lowell	88 Pleasant St.
Dolan, Clifford	Hudson	1 South College
Eastman, Perley Monroe	Townsend	E. M. Dickinson's
Edwards, Frank Laurence	Somerville	Mt. Pleasant
Farley, Arthur James	Waltham	11 South College
Farrar, Parke Warren	Springfield	8 South College
Flint, Clifton Leroy	Amesbury	Exp. Station, East
Gillett, Chester Socrates	Southwick	Kappa Sig. House
Gillett, Kenneth Edward	Southwick	17 South College
Gowdey, Carlton Craig	*Bridgt'n, Barbados*	116 Pleasant St.
Hayes, Herbert Kendall	*No. Granby, Conn.*	7 South College
Howe, William Llewellen	Marlboro	9 South College
Hutchings, Frank Farley	Amherst	116 N. Pleasant St.
Hyslop, James Augustus	*Rutherford, N. J.*	12 South College
Jackson, Raymond Hobart	Amherst	26 Lincoln Ave.
Jennison, Harry Milliken	Millbury	12 South College
Johnson, Frederick Andrew	Westford	20 South College
Jones, Thomas Henry	Easton	5 South College
Larned, Adelbert Joseph	Amherst	Lock Box 206
Larsen, Lars David	*Bridgeport, Conn.*	Clark Hall
Liang, Lai-Kwei	*Tientsin, China*	80 Pleasant St.
Miller, Danforth Parker	Worcester	Kappa Sig. House
Paige, George	Amherst	Thompson House
Parker, John Robert	*Poquonock, Conn.*	7 South College
Philbrick, Edwin Daniels	Somerville	18 South College
Reed, Horace Bigelow	Worcester	Kappa Sig. House
*Regan, William Swift	Northampton	84 Pleasant St.
Sawyer, William Francis	Sterling	77 Pleasant St.
Shattuck, Leroy Altus	Pepperell	10 South College
Thurston, Frank Eugene	Worcester	18 South College
Turner, Olive May	Amherst	22 Spaulding St.
Turner, William Franklin	Reading	9 South College
Verbeck, Roland Hale	Malden	13 South College
Warner, Theoren Levi	Sunderland	6 South College

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* Work incomplete.

Waugh, Thomas Francis	Worcester	14 North College
Wellington, Joseph Worcester	Waltham	11 South College
Wheeler, Hermon Wheeler	Lincoln	6 South College
Whiting, Albert Lemuel	Stoughton	Veterinary Labor'y
Whitmarsh, Raymond Dean	Amherst	88 Pleasant St.
Wright, Samuel Judd	South Sudbury	Dairy Barn

Total, 57.

JUNIOR CLASS

Adams, William Everett	Chelmsford	88 Pleasant St.
Alger, Paul Edgar	Reading	E. S. Puffer's
*Barlow, Waldo Darius	Amherst	7 Northampton Rd
Barnes, Benjamin Franklin, Jr.	Haverhill	79 Pleasant St.
Bartlett, Oscar Christopher	Westhampton	R. G. Goldberg's
*Briggs, Orwell Burlton	Egremont	Insectary
Brown, George Murray, Jr.	Cambridge	E. H. Forristall's
*Caffrey, Donald John	Gardner	Exp. Station, West
*Cardin, Patricio Penñeradonda	*Artemisia, Cuba*	66 Pleasant St.
Chase, Edward Irving	Somerville	30 N. Prospect St.
*Codding, George Melvin	Taunton	15 South College
Corbett, Lamert Seymour	Jamaica Plain	5 North College
*Crosby, Harold Parsons	Lenox	Prof. Cooley's
*Crossman, Samuel Sutton	Needham	10 North College
Curran, David Aloysius	Marlboro	John Walsh's
Cutler, Homer	Westboro	Leigh Weaver's
*Fulton, Russell Gordon	Lynn	Exp. Station, West
*Gates, Clarence Augustus	Worcester	75 Pleasant St.
Geer, Myron Francis	Springfield	28 North College
Geer, Wayne Emory	Springfield	28 North College
Hathaway, Elmer Francis	Cambridge	79 N. Pleasant St.
*Hayward, Warren Willis	Millbury	John Walsh's
Hsieh, En-Lung	*Tientsin, China*	44 Triangle St.
Hubbard, Arthur Ward	Sunderland	9 North College
*Ide, Warren Leroy	Dudley	82 Pleasant St.
Jen, Huan	*Tientsin, China*	31 E. Pleasant St.
*Knight, Harry Orrison	Gardner	96 Pleasant St.
Lindblad, Rockwood Chester	North Grafton	12 North College
Lull, Robert Delano	*Windsor, Vt.*	54 Pleasant St.

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* Work incomplete.

MacGown, Guy Ernestus	*South Britain, Conn.*	Leigh Weaver's
Monahan, James Valentine	South Framingham	J. J. Walsh's
Neale, Harold Johnson	Worcester	96 Pleasant St.
Noble, Harold Gordon	Springfield	75 Pleasant St.
Noyes, John	Roslindale	Wilder Hall
*O'Donnell, John Francis	Worcester	96 Pleasant St.
*O'Grady, James Raphael	Holliston	6 North College
*Oliver, Joseph Thomas	Dorchester	10 Allen St.
Phelps, Harold Dwight	West Springfield	25 North College
Potter, Richard Chute	Concord	Prof. Cooley's
Putnam, Charles Sumner	Princeton	E. M. Dickinson's
*Sexton, George Francis	Worcester	95 Pleasant St.
*Shamiae, George Mansoor	*Damascus, Syria*	99 Pleasant St.
Smulyan, Marcus Thomas	*New York, N. Y.*	101 Pleasant St.
Thompson, Myron Wood	Halifax	14 South College
Thomson, Jared Brewer	Monterey	25 North College
*Turner, Henry William	*Trinidad, Cuba*	116 Pleasant St.
Warner, Frederick Chester	Sunderland	9 North College
Waters, Theodore Charles	*Rocky Hill, Conn.*	60 Pleasant St.
*Webb, Charles Russell	Worcester	10 South College
Whaley, James Sidney	*East Orange, N. J.*	12 E. Pleasant St.
White, Charles Howard	*Providence, R. I.*	E. H. Forristall's
*White, Herbert Linwood	*Uniontown, Ky.*	Charles Kellogg's
*Willis, Luther George	Melrose Highlands	10 North College
*Wilson, Frank Herbert Jr.	Nahant	Prof. Cooley's

Total, 54.

SOPHOMORE CLASS

Allen, Rodolphus Harold	Fall River	Kappa Sig. House
*Annis, Ross Evered	Natick	15 South College
*Armstrong, Robert Pierson	*Rutherford, N. J.*	26 North College
Bailey, Dexter Edward	Tewksbury	77 Pleasant St.
*Bailey, Justus Conant	Wareham	Mt. Pleasant
*Beeman, Francis Stone	Amherst	86 Main St.
*Blaney, Jonathan Phillips	Swampscott	22 North College
Brandt, Louis	Everett	Clark Hall
Brooks, Henry Alvan	*Cleveland, O.*	16 South College
Brooks, Sumner Cushing	Amherst	Prof. W.P. Brooks's

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* Work incomplete.

Brown, Louis Carmel	Bridgwater	Kappa Sig. House
Burke, Edward Joseph	Holyoke	96 Pleasant St.
*Cary, William Ernest	*Gansevoort, N. Y.*	
Clark, Walter Roe	*Milton-on-Hudson, N.Y.*	Kappa Sig. House
Cloues, William Arthur	*Warner, N. H.*	Exp. Station ,West
Cowles, Henry Trask	Worcester	77 Pleasant St.
*Damon, Edward Farnham	Concord Junction	14 South College
Dickinson, Lawrence S.	Amherst	M. A. C. Grounds
Eddy, Roger Sherman	Boston	116 Pleasant St.
Everson, John Nelson	Hanover	2 South College
Fisk, Raymond John	Stoneham	6 Phillips St.
Folsom, Josiah Chase	Billerica	24 North College
*Francis, Henry Russell	Dennisport	E. M. Dickinson's
*French, Horace Wells	*Pawtucket, R. I.*	13 South College
Haynes, Frank Tuttle	Sturbridge	77 Pleasant St.
*Hazen, Myron Smith	Springfield	82 Pleasant St.
Holland, Arthur Witt	Shrewsbury	27 North College
Johnson, William Clarence	South Framingham	11 North College
*Lambert, Marjorie Willard	*West New Brighton, N. Y.*	Draper Hall
Leonard, William Edward	Belmont	22 North College
McGraw, Frank Dobson	Fall River	11 North College
*McLaine, Leonard Septimus	*New York, N. Y.*	84 Pleasant St.
Mendum, Samuel Weis	Roxbury	6 Phillips St.
*Nickless, Fred Parker	Carlisle	21 North College
Oertel, Charles Andrew	South Hadley Falls	So. Hadley Falls
*Partridge, Frank Herbert	Cambridge	7 North College
*Prouty, Frank Alvin	Worcester	26 North College
Robb, Allen James	Wilbraham	82 Pleasant St.
*Rockwood, Albert Fletcher	Concord	116 Pleasant St.
Schermerhorn, Lyman Gibbs	*Kingston, R. I.*	5 North College
Thomas, Frank Lincoln	Concord	21 North College
*Titus, Willard McCready Snow	New Braintree	16 South College
Turner, Edward Harrison	Reading	Plant House
Urban, Otto Velorous Taft	Upton	Kappa Sig. House
*Vinton, George Newton	Sturbridge	Thompson House
Waldron, Ralph Augustus	Hyde Park	East Exp. Station
*Wallace, William Newton	Amherst	6 Phillips St.

Total, 47.

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* Work incomplete.

FRESHMAN CLASS

Adams, James Fowler	Melrose	Prof. Cooley's
Allen, Park West	Westfield	88 Pleasant St.
Armstrong, Ralph Henry	Holyoke	6 Allen St.
Baker, Herbert Jonathan	*Selbyville, Del.*	88 Pleasant St.
Barrows, Raymond Corbin	*Union, Conn.*	E. H. Forristall's
Beals, Carlos Loring	Sunderland	L. Weaver's
Bearse, Alvin Wellington	West Harwich	E. M. Dickinson's
Becker, John Jr.	Hyde Park	3 McClellan St.
Bentley, Arnold Gordon	Hyde Park	3 McClellan St.
Blaney, Herbert Wardwell	Swampscott	82 Pleasant St.
Bliss, William Henry	Springfield	
Brown, Edgar Morton	West Springfield	88 Pleasant St.
Brown, Irving Clarence	Natick	6 Allen St.
Burnham, Arthur James	Holyoke	6 Allen St.
Bursley, Allyn Parker	West Barnstable	6 Allen St.
Chadbourne, James Green	*Bridgton, Me.*	88 Pleasant St.
Coash, William Henry	Lawrence	60 Pleasant St.
Coles, Chester Ernest	Attleboro	66 Pleasant St.
Conant, Arthur Theodore	Sunderland	Sunderland
Damon, Charles Murry	Haydenville	Mr. Goldberg's
Daniels, Lewis Ernest	Cambridge	7 North College
Davey, James Abram	*Kent, Ohio*	96 Pleasant St.
Davis, Egbert Norton	Sherborn	77 Pleasant St.
Davis, Irving Wilder	Lowell	88 Pleasant St.
Denslow, Raymond Albert	East Longmeadow	Pres. Butterfield's
Drury, Harold Blake	Athol	23 North College
Fitzgerald, James Edward	Bondsville	Depot St.
Gilgore, Irvin Craig	*Schenectady, N.Y.*	9 Fearing St.
Grey, George Herbert	Chelsea	75 Pleasant St.
Gunn, Clarence Armstrong	Southampton	L. Weaver's
Hallowell, Royal Norton	Jamaica Plain	88 Pleasant St.
Hammond, Charles Philip	Lynn	3 Fearing St.
Harrington, Henry Lorenzo	Rockland	
Hazen, Jacob	Georgetown	
Hennessey, William Francis	Dorchester	75 Pleasant St.
Henry, Willard Francis	Hopedale	82 Pleasant St.
Hill, Nathaniel Herbert	*Glenmoore, N. J.*	77 Pleasant St.
Howard, Frederick William	*Woodstock, Conn.*	E. H. Forristall's
Howe Harold Hosmer	Springfield	82 Pleasant St.

Huang, Chen-Hua	*Tientsin, China*	75 Pleasant St.
Hyatt, Herbert Francis	Leominster	Nash Hall
Jenks, Albert Roscoe	Three Rivers	88 Pleasant St.
Johnson, Leonard Matthews	Easthampton	Easthampton
Labouteley, Gaston Edward	Lynn	101 Pleasant St.
Larrabee, Edward Arthur	Salem	5 Fearing St.
Lew, Gerard Nelson	Lowell	17 E. Pleasant St.
Liang, Ying Chi	*Chefoo, China*	31 Lincoln Ave.
Lodge, Charles Albert Jr.	Manchester	87 Pleasant St.
Loker, Walter Melvin	Natick	75 Pleasant St.
McGann, Philip Sheridan	Somerville	
McLaughlin, Frederick Adams	Lee	88 Pleasant St.
McNayr, Rupert Stanley	Rockland	96 Pleasant St.
Merrill, Charles Edward	West Somerville	Nash Hall
Merrill, George Bates	North Abington	101 Pleasant St.
Moody, Chester	Chelsea	44 Triangle St.
Morse, Henry Bowditch	Salem	75 Pleasant St.
Nickerson, George Payne	Amherst	25 Main St.
Nielsen, Gustaf Arnold	West Newton	116 Pleasant St.
Ostrolenk, Bernhard	*Gloversville, N.Y.*	23 North College
Packard, Clyde Monroe	Springfield	96 Pleasant St.
Parsons, Samuel Reynolds	North Amherst	North Amherst
Patch, Roland Harrison	Wenham	88 Pleasant St.
Pauly, Herman Alfred	Somerville	Nash Hall
Phipps, William Raymond	Holliston	56 Pleasant St.
Pickard, Percy William	Hopedale	82 Pleasant St.
Piper, Ralph Waldo	South Acton	116 Pleasant St.
Prouty, Philip Herman	Shrewsbury	27 North College
Racicot, Phileas Armand	Lowell	96 Pleasant St.
Robb, Gordon Howard	Salem	5 Fearing St.
Roberts, Charles Elliott	Amherst	Hazel Ave.
Robinson, Ralph Cushing	South Boston	9 Fearing St.
Robinson, Sturgis Mardenborough	E. Weymouth	17 E. Pleasant St.
Rosenbaum, Joseph	*Woodbine, N. J.*	Thompson House
Schmitz, Frank Julius	*Waterbury, Conn.*	116 Pleasant St.
Sharpe, Arthur Harris	Saxonville	"Plumtrees."
Smith, Clarence Albert	Northampton	5½ E. Pleasant St.
Smith, Raymond Goodale	Lynn	5 Fearing St.
Spencer, Howard	Belchertown	Belchertown
Stevenson, Lomas Oswald	*Hackensack. N. J.*	87 Pleasant St.

Tilton, George Albert	*Exeter, N. H.*	60 Pleasant St.
Wheeler, Ralph Elgin	Foxboro	2 McClellan St.
Whitney, Raymond Lee	Brockton	M. A. C. Barn
Whittaker, Elmer Carlin	*Ravenna, Ohio*	96 Pleasant St.
Willard, Harold Francis	Leominster	Nash Hall
Williams, George Edmund	Belchertown	
Wood, Alton Palmer	Braintree	
Young, Donnell Brooks	North Hanover	96 Pleasant St.

Total, 87.

SHORT COURSES

Summer School, 1907

Abbe, Florence M.	Springfield
Abbott, Florence I.	Andover
Adams, Lena R.	North Brookfield
Alger, Cora Hayward	Brockton
Alger, Lilla Marion	Reading
Allen, Lyman Richards	North Adams
Archibald, May H.	Rockland
Aymar, Mary A.	Medford
Bachelder, Kate M.	New Salem
Baker, Florence M.	Amherst
Baker, L. Ada	Amherst
Baker, Rita G.	Boston
Belcher, S. Elizabeth	Worcester
Bemis, Clara H.	Worcester
Boynton, Myra L.	Florence
Bradbury, Elizabeth R.	Medford
Bradley, Ida May	Springfield
Brennen, Helen E.	*New Dorp, N. Y.*
Brennen, Mary Florence	*New Dorp, N. Y.*
Brewster, Lois B.	Plymouth
Briggs, Teresa E.	Great Barrington
Britt, Emma	South Boston
Brooks, Laura J.	Stoneham
Bruorton, Rebekah	Manchester
Buckley, Emma	Worcester
Buckley, Mary E.	Brookline
Burns, Agnes C.	Worcester

Burns, Mary J.	Worcester
Burroughs, Marion E.	West Acton
Butler, Julia A.	Worcester
Butler, Mary E.	Worcester
Butler, William F.	Worcester
Butterfield, Annie J.	Worcester
Byron, Mary R.	Watertown
Callahan, Mary J.	Worcester
Canterbury, Adeline M.	East Weymouth
Case, Jennie M.	*Norwich, Conn.*
Casey, Susan	Hingham
Chapman, Lloyd W.	Pepperell
Cheney, Hazel Chase	Amherst
Churchill, Abby P.	Fitchburg
Clancey, Annie E.	Worcester
Cole, Maude M.	Springfield
Collins, William Thomas	Fall River
Colvin, Mary P.	Gilbertville
Corliss, Katharine M.	Worcester
Cummings, Annie F.	Taunton
Curley, Thomas S. S.	Waltham
Currier, Frances W.	Brighton
Curtis, Mary A.	Springfield
Cushman, Esther Cowles	*Woonsocket, R. I.*
Danahey, John J.	Amherst
Davis, Carrie I.	Taunton
Davis, Paul A.	Lowell
Davison, Frank P.	Turners Falls
Draper, Lizette M.	Worcester
Drew, A. Mabel	New Bedford
Drury, Susan F.	Everett
Earle, Elizabeth	*New Haven, Conn.*
Eldred, Marcia B.	*North Pownal, Vt.*
Ellis, Angie B.	Brockton
Emerson, Edith W.	Winter Hill
Emerson, George W.	Lunenburg
Emerson, Winifred	Boston
Farrand, Royce H.	Charlemont
Farrar, Mabel K.	Amherst
Fay, Louise	Waltham

Field, Nan S.	Montague
Findeisen, Maud Frederica	Concord
Findeisen, Minna Augusta	Concord
Flaherty, Margaret A.	Worcester
Fletcher, Elizabeth	*Essex, Vt.*
Forsythe, Elizabeth S.	*Chadd's Ford, Pa.*
Frost, Clara D.	Springfield
Frost, Florence E.	Salem
Gardner, Amy L.	*New Haven, Conn.*
Geer, Mabel	Belchertown
Gifford, Mrs. Alice B.	Amherst
Gilday, Theresa M.	Springfield,
Goddard, Emma J.	Grafton
Gould, Ella F.	Brockton
Granger, Helen	Cambridge
Grover, Ada M.	Amherst
Guss, Roland W.	North Adams
Haley, Charles W.	Milford
Hall, Ada V.	Manchester
Hall, Alice S.	Winter Hill
Harlow, Louise D.	*Brooklyn, N. Y.*
Harrington, Alona	Malden
Harrington, Martha E.	North Amherst
Harris, Henrietta Corson	Springfield
Hastings, George H.	Fitchburg
Heffernan, Winifred R.	Northampton
Hinckley, Grace M.	Amherst
Hoar, Alice May	Worcester
Humiston, Wallace D.	*Bethany, Conn.*
Jacob, Louisa M.	*Lansdowne, Pa.*
Jeannerett, Georgina	*Mt. Vernon, N. Y.*
Jencks, Martha A.	West Somerville
Jones, H. J.	Holden
Kalaher, Helena M.	Worcester
Keith, Mary Cary	Brockton
Kendall, Annie L.	Brockton
Kendall, Martha A.	Brockton
Kennedy, H. Anna	South Weymouth
Kent, Nellie	Clinton
Ketcham, Alice M.	Springfield

Kiggen, Elizabeth	Hyde Park
Kiggen, Helen J.	Hyde Park
Kimball, Mildred R.	Charlestown
Kingman, Catharine P.	Amherst
Lamphier, Annie J.	North Adams
Lane, Anna C.	Lawrence
Lane, Mary Elizabeth	*Atlanta, Ga.*
Lane, Sara	Brockton
Lane, Therese A.	Lawrence
Lathrop, Helen M.	*Norwich, Conn.*
Lawley, Mary E.	Holyoke
Lawlor, Elizabeth A.	Lawrence
Lilley, Alice	Fairhaven
Locke, Alice M.	Salem
Lyman, C. S.	Hudson
Lyman, Grace Greenleaf	Easthampton
Lynch, Mary A.	Springfield
Mache, Marie	Springfield
MacInnis, Elizabeth	Lawrence
MacIntyre, Katherine	Provincetown
Manter, Grace H.	Brookline
Marsh, Nina M.	Westfield
Marshall, Mrs. Ella O.	New Salem
Marshall, Margaret	New Bedford
Mask, Homer B.	*Camp Hill, Ala.*
Mason, Isadore Helen	Gardner
Mattson, W. Frank	Boston
Mattson, Mrs. W. Frank	Boston
McKechnie, Addie	Springfield
Mead, Mrs. S. Howard	*Norwich, Conn.*
Meggett, Marshall M.	Brookline
Miller, Susie T.	Brockton
Mitchell, Margaret D.	Charlestown
Mitchell, Mary C.	Charlestown
Morse, Esther C.	South Lancaster
Morse, Margaret	Amherst
Morton, O. A.	Marlboro
Mullins, Gertrude	Springfield
Murray, Anna M.	Worcester
Nichols, Jennie S.	Williamsburg

Olds, Rosabelle M.	Belchertown
O'Reilley, Mary A.	Ware
Parker, Agnes C.	Uxbridge
Parker, Kate E.	Worcester
Parkhurst, Dorothy	Amherst
Paull, Marrial E.	Montague
Pearson, Mary A.	North Adams
Peffers, Mary A.	Stoneham
Platt, L. Marietta	*New Haven, Conn.*
Pratt, Carrie E.	Hadley
Pratt, E. L.	Boston
Pratt, Etta C.	North Dana
Pratt, Helen A.	North Dana
Pratt, Henrietta	Waltham
Pratt, Louis A.	North Dana
Pyne, Sallie S.	Springfield
Raley, Jane P.	*Beverly, N. J.*
Richmond. Lilla G.	Indian Orchard
Riley, Ernest E.	Needham
Robinson, Mary B.	Waltham
Robinson, Ralph Cushing	South Boston
Rogan, Katherine S.	Boston
Roy, G. Calista	Watertown
St. John, Chloe	Springfield
Sanders, A. Louisa	Wayland
Sanford, Alice I.	*Willimantic, Conn.*
Saunders, Lucy B.	Brockton
Scarborough, Emily B.	*New Britain, Conn.*
Schoepf, Mrs. H. M. C.	Springfield
Scott, Mary L.	Worcester
Scranton, Nellie T.	*New Haven, Conn.*
Sears, Anna Moore	Millbury
Sears, J. W.	*Watha, N. C.*
Seavey, Alma F.	Natick
Shafter, Harriet L.	New Bedford
Smith, Helen M.	Amherst
Smith, J. Angeline	Hopedale
Smith, Laura Ethel	West Somerville
Smithick, Alice C.	Brockton
Spavin, Annie M.	Revere

Spear, Harriet E.	North Amherst
Spencer, Jennie L.	*Norwich, Conn.*
Standish, Clara M.	Framingham
Stanton, L. Angie	*Norwich, Conn.*
Swett, Lena S.	*Burlington, Vt.*
Tierney, William A.	Worcester
Tighe, Miriam A.	Salem
Tilton, Cordelia Warren	Brockton
Tobin, Ellen Caroline	Lawrence
Tredick, Helen Folsom	*Exeter, N. H.*
Tucker, Arabella H.	Worcester
Tufts, Mary I.	Lynn
Turnbull, Agnes Mary	Charlestown
Vinal, Nellie B.	Scituate Center
Walcott, Jennie M.	Barre
Ward, Emma M.	*Norwich, Conn.*
Ward, John Herbert	East Bridgewater
Waterman, Hannah P.	North Adams
Watkins, Clara F.	West Millbury
Williams, Clara H.	Beverly
Wilson, Laura Luella	*Norwich, Conn.*
Winslow, Alice V.	Framingham
Wood, Marion	Dorchester

Total, 210.

Short Winter Courses

Dairy Farming, 1908

Barber, John Jarvis	Great Barrington
Barrows, Edward Howell	Hathorne
Bates, George Augustus	Westfield
Benton, Percy Walker	*Morris, Conn.*
Blair, Raymond Lester	Blandford
Blanchard, Wallace Jerome	Holyoke
Bowker, Roswell Gleason	Dorchester
Bryant, Leroy	Petersham
Childs, Chesman Oliver	*North Sutton, N. H.*
Cogswell, Wilbur Low	Essex
Cressey, Warren Wilmot	Great Barrington
Day, Walter Otis	Westford
Drought, Roger Scott	Greenwich Village

Goldberg, Rudolph Julius	Amherst
Hamilton, James Lewis, Jr.	*Whitingham, Vt.*
Hill, George Arthur	*Concord, N. H.*
Jackson, Hector	Medford
Johnson, Fred Porter	*Gilbertsville, N. Y.*
Kingston, George William	*Lawrenceville, N. Y.*
Mirick, Robert Stephen	Worcester
Monk, Rodney Elijah	Sharon
Murray, Daniel Edwin	Petersham
Noonan, James William	Great Barrington
Okell, Harold	Worcester
Proctor, Galen Abner	Townsend
Ralph, Dana Alton	North Attleboro
Sawyer, Walter David	*Winchester, N. H.*
Shore, Charles	Worcester
Sladen, Charles Edwin	Newtonville
Spaulding, William Austin Jr.	*Norfolk, Conn.*
Wild, Morris McKendry	Tyngsboro
Wood, Alton Palmer	Braintree

Total, 32.

Bee Culture, 1907

Bayles, James	Lowell
Beaubien, Arthur	Montague
Crane, Mrs. Florence Marshall	Amherst
Crittenden, Ella Mary	Northampton
Emmons, Eleann Bacon	Falmouth
Ludlam, Emily	Lowell
Swazey, Geneva Winnie	Springfield
Thompson, Harriet Ella	Hadley
Thompson, Ethel	*York Harbor, Me.*
Haynes, Edith M.	Boston

Total, 10.

SUMMARY BY CLASSES AND COURSES

Graduate students		7
Senior class	57	
Junior class	54	
Sophomore class	47	
Freshman class	87	
		245
		252
Short courses :		
Summer School, 1907	210	
Winter Course, Dairy Farming (1908)	32	
Bee Culture, 1907	10	
		252
		504
Counted twice		4
Total		500

GEOGRAPHICAL SUMMARY

Massachusetts	419
Connecticut	24
New York	13
New Jersey	7
New Hampshire	6
Vermont	5
Rhode Island	4
Ohio	3
Maine	2
Pennsylvania	2
China	5
Cuba	2
Alabama	1
Delaware	1
Georgia	1
Illinois	1
Kentucky	1
North Carolina	1
Barbados	1
Syria	1
Total	500

ALUMNI

Alumni Associations

Associate Alumni:

President, E. A. Ellsworth, '71, Holyoke.
Secretary, H. F. Tompson, '05, Amherst.

Alumni Club of Massachusetts:

President, F. W. Davis, '89, Roslindale.
Secretary, Newton Shultis, '96, Chamber of Commerce, Boston.

Massachusetts Agricultural College Club of New York:

President, Dr. Winfield Ayres, '86, New York City.
Secretary, A. R. Fowler, '80, 525 West 23d St., New York City.

Western Alumni Association:

President, A. B. Smith, '95, Chicago, Ill.
Secretary, P. C. Brooks, '01, Chicago, Ill.

Connecticut Valley Association:

President, Walter I. Boynton, '92, Springfield.
Secretary, H. D. Hemenway, '95, Northampton.

Massachusetts Agricultural College Club of Washington, D. C.:

President, R. B. Moore, '88, Philadelphia, Pa.
Secretary, F. D. Couden, '04, Washington, D. C.

Local Alumni Association:

President, R. W. Lyman, '71, Northampton.
Secretary, A. C. Monahan, '00, Montague.

Class Secretaries

1871. E. E. Thompson, Worcester.
1872. S. T. Maynard, Northboro.
1873. C. Wellington, Amherst.
1874.

1875. M. Bunker, Newton.
1876. C. Fred Deuel, Amherst.
1877.
1878. C. O. Lovell, 48 Summer St., Boston.
1879. R. W. Swan, Worcester.
1880.
1881. J. L. Hills, *Burlington, Vt.*
1882. G. D. Howe, 16 Lewis Wharf, Boston.
1883. S. M. Holman, Attleboro.
1884. L. Smith, Worcester.
1885. E. W. Allen, *Washington, D. C.*
1886.
1887. F. H. Fowler, Boston.
1888. H. C. Bliss, Attleboro.
1889. C. S. Crocker, *Philadelphia, Pa.*
1890. F. W. Mossman, Westminster.
1891. W. A. Brown, Springfield.
1892. H. M. Thomson, *Thompson, Conn.*
1893. F. A. Smith, Ipswich.
1894. S. Francis Howard, Amherst.
1895. H. A. Ballou, *Barbados, West Indies.*
1896.
1897. C. A. Peters, *Moscow, Idaho.*
1898. S. W. Wiley, *Baltimore, Md.*
1899. D. A. Beaman, *Ponce, Porto Rico.*
1900. E. K. Atkins, Northampton.
1901. J. H. Chickering, Dover.
1902. H. L. Knight, *Washington, D. C.*
1903. G. D. Jones, North Amherst.
1904. P. F. Staples, North Grafton.
1905. P. F. Williams, Milton.
1906. Richard Wellington, *Geneva, N. Y.*
1907. G. H. Chapman, Amherst.

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